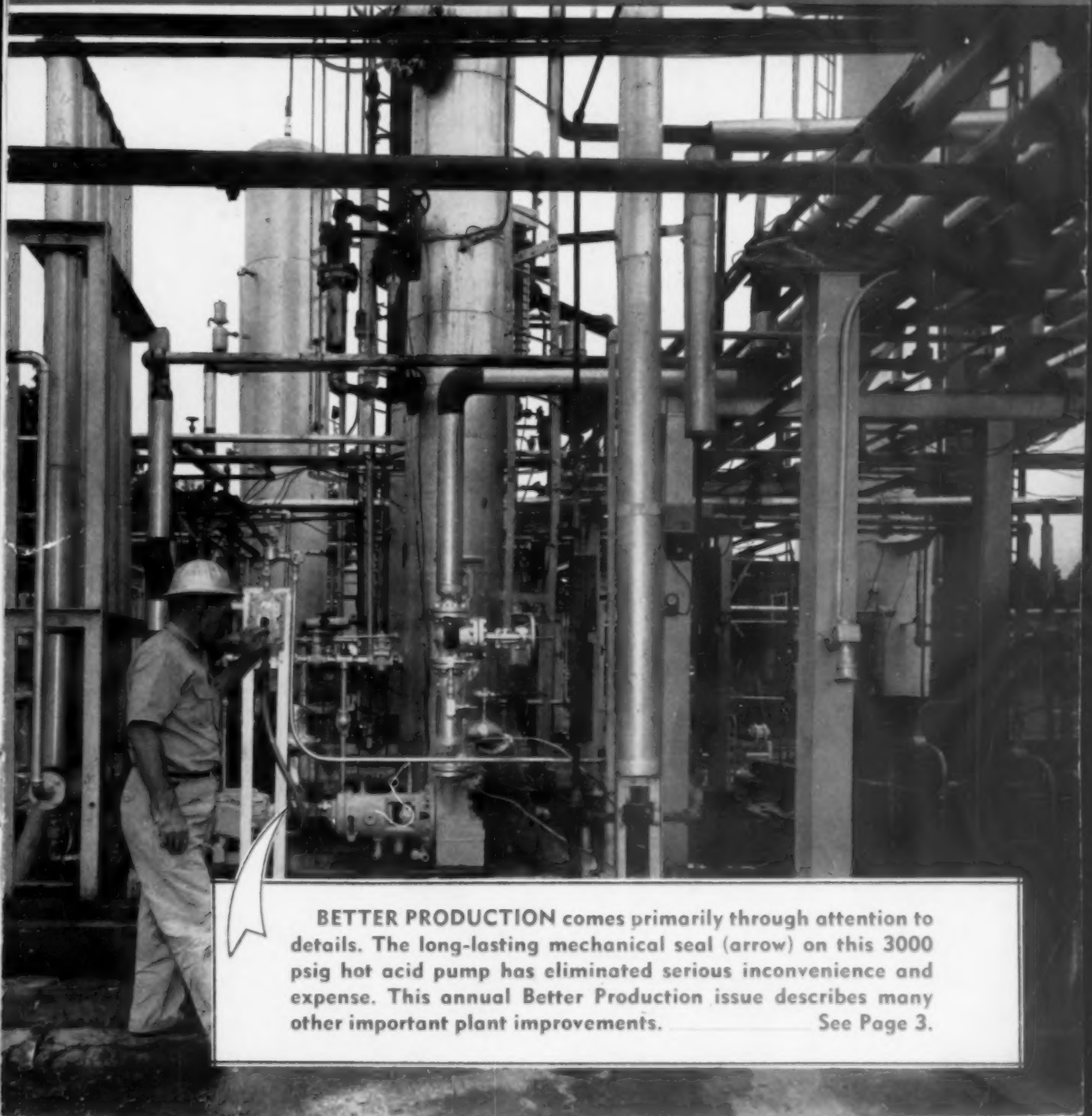


# ***Southern Power & Industry***

**The Industrial and Power Journal of the South and Southwest**

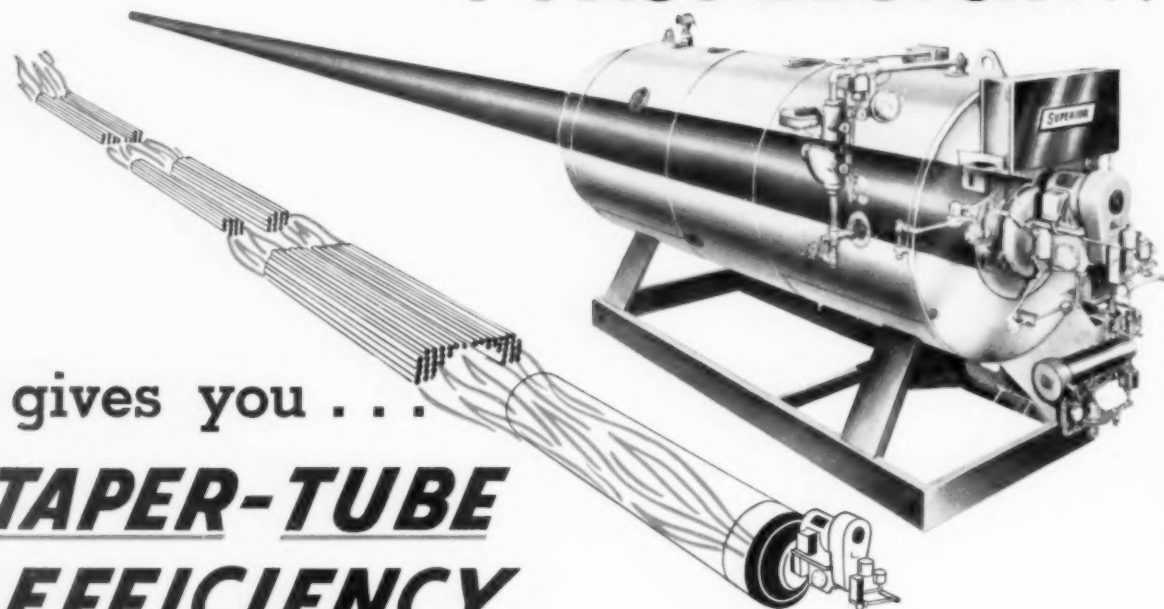
**A W. R. C. Smith Publication**

**OCTOBER, 1961**



**BETTER PRODUCTION** comes primarily through attention to details. The long-lasting mechanical seal (arrow) on this 3000 psig hot acid pump has eliminated serious inconvenience and expense. This annual Better Production issue describes many other important plant improvements. See Page 3.

# HOW **SUPERIOR'S** **4-PASS DESIGN...**



## gives you . . . **TAPER-TUBE** **EFFICIENCY**

The long-lived efficiency of Superior Packaged Boilers results from fundamentals of design which are basically sound. Superior's 4-pass, down-draft design provides a minimum of 5 sq. ft. of heating surface for each unit of horsepower rating; and every inch of that heating surface is effective.

### *Why 4-PASS?*

Theoretically (from the standpoint of heat transfer alone) the fire passes of a perfectly designed fire tube boiler would resemble a long, very gradually tapered cone surrounded by water. The large end would be sized in ratio to the volume and speed of the combustion gases so that the gases would be crowded into the tube and thus "scrub" the walls of the tube, forcing contact between fire and tube surface. As the gases give up their heat to the surrounding water (by transfer through the tube) the gases shrink in volume. The gradual taper of the tube compensates for this

shrinkage, maintaining the scrubbing action which promotes efficient heat transfer.

Such a fire tube is impractical; but Superior's 4-pass design achieves the same effect. Its 4 passes are so designed that each successive pass has a lesser number of tubes (and hence a smaller area in cross section) for the passage of combustion gases. This is, in effect, taper-tube performance which results in the maximum practical efficiency of heat transfer . . . performance which makes it possible for Superior to guarantee more than 80% thermal efficiency under field operating conditions.

Superior Packaged Boilers are completely factory assembled, backed by undivided responsibility. Burn gas or oil, or both. Sizes from 20 to 600 b.h.p. for pressures up to 250 p.s.i. or for hot water.

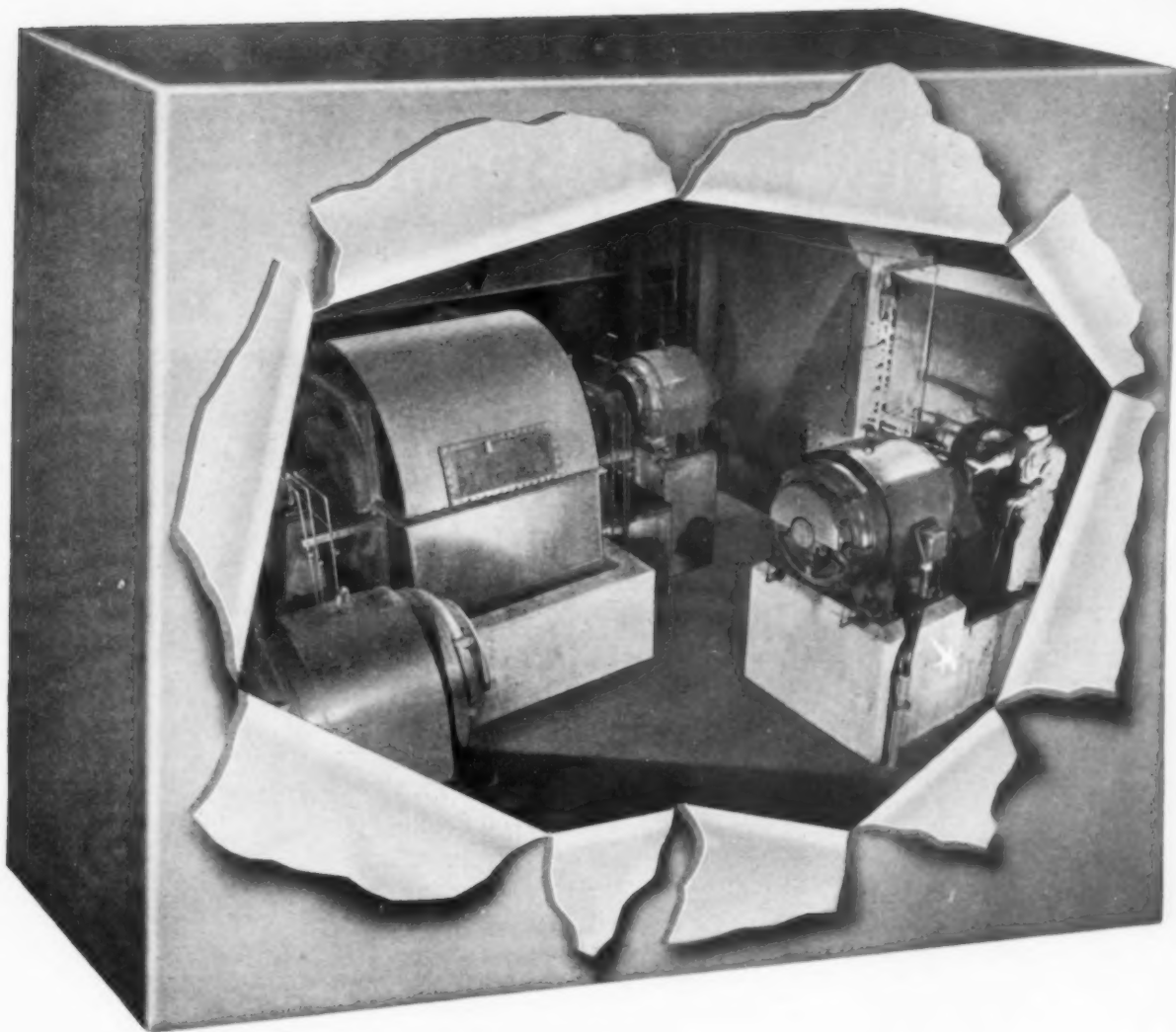
*For condensed data describing the World's Most Complete Line of Packaged Boilers write today for Catalog S-15*

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PACKAGED BOILERS

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More power to **ALTON** BOX BOARD

... with the help of CLARAGE

Mechanical draft is among several assignments of Clorage equipment at Alton Box Board Co., Alton, Illinois.

On the left above in the power plant, a Clorage Type W, Class III double inlet fan equipped with Vortex Control provides forced draft . . . on

the right is one of the two Clorage Type RT double inlet fans furnishing induced draft.

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SOUTHERN POWER & INDUSTRY for OCTOBER, 1961

For more information, Use Reply Card—Page 85

1

for strength,  
economy,  
durability



## New **ECONO-BEAM** Guardrail



Four splice bolts and one post bolt are only fasteners required to connect sections and hold to post.

Workmen install a 25-foot length of ECONO-BEAM Guardrail in an industrial parking lot. It is strong, yet light in weight.

### **Saves Money Without Sacrificing Safety**

For more than 25 years, Armco has supplied deep-beam steel guardrail to help safeguard the nation's highways. But heavy guardrail designed for highway speeds is unnecessary in industrial parking lots, or inside plants.

So Armco has introduced 16-gage ECONO-BEAM® Guardrail, especially designed for industrial applications. It weighs 43% less than standard guardrail, requires only 4 splice bolts as compared with 8 for highway guardrail—so is substantially lower in cost.

This guardrail is supplied with a zinc coating in 12½ or 25-foot lengths. It is usually installed on wood posts. Also available in curved lengths.

Write us for more data on this new industrial guardrail. **Armco Drainage & Metal Products, Inc.**, subsidiary of Armco Steel Corporation, P.O. Box 1343, Atlanta 1, Georgia.

 **ARMCO Drainage & Metal Products**





# Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

Eugene W. O'Brien  
Managing Director

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No. 10

OCTOBER, 1961

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## Electrical Protection goes MODERN

• with BUSS Fuses...

# *in All-Electric Schools*

*Utica Michigan*

Electricity heats, lights, pumps water, cooks and operates all motor driven equipment in the West Utica and the Ewell Elementary Schools. No other utility service is used except the telephone.

The complete use of electrical energy puts special emphasis on the need to use the safest, most modern protective devices throughout the electrical system.

In each school, the main switchboard is protected by 3—1600 ampere BUSS Hi-Cap fuses having an interrupting rating of 200,000 amps. rms symmetrical. Thus, safe interruption of fault currents now available is assured,—and the fuses are adequately safe to allow for future system growth.

If a high fault current should occur, the fast opening characteristics of BUSS Hi-Cap fuses further protect the circuits and equipment against damage by restricting let-thru fault currents to safe value.

### *Feeder and branch circuit protection*

To provide the safest short-circuit and overload protection... and to prevent needless outages,—FUSETRON dual-element fuses are used in the feeders and branch circuits of these schools.

For modern, all-purpose protection of circuits up to 600 amps., FUSETRON fuses cannot be equalled. They have 100,000 amp. interrupting capacity,—and sufficient time-lag to hold harmless overloads.

*For more information on*

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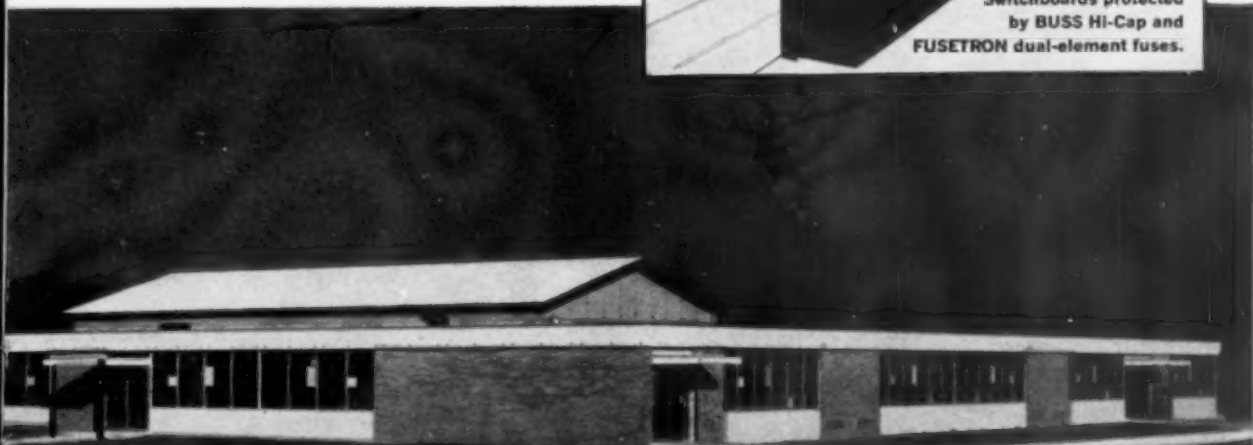
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by BUSS HI-Cap and  
FUSETRON dual-element fuses.



WEST UTICA SCHOOL



*with Safety!*



# Facts and Trends

For more information on any of the following items—  
Write the editors of SOUTHERN POWER & INDUSTRY  
1760 Peachtree Road, N.W., Atlanta 9, Ga.

October, 1961

- ◆ **FLOATING ATOMIC POWER**—The floating nuclear power plant which the Army Corps of Engineers has ordered into production will be designed and built by The Martin Company under a \$17 million contract. It will be housed in a reconditioned Liberty ship and will be towed from place to place as needed.

In contrast with the 110,000 barrels of oil a year needed by a conventional plant of the same size, the 10,000 kilowatt Martin system will use a nuclear fuel core less than four feet in diameter and only a little more than three feet high. The reactor planned by Martin is a "pressurized water" system, using the same basic techniques which have proved successful and reliable in a number of stationary atomic plants.

- ◆ **SUN-POWERED PLANT**—A small self-contained electric power plant and pumping unit is described by Westinghouse Electric Corporation. A prototype, including a 50-watt power plant, has been built and tested.

Developed in cooperation with the Solar Energy Laboratory of the University of Wisconsin, the experimental unit taps the heat energy of sunlight and converts it directly into electricity by means of a thermoelectric generator. The power generated drives an electric motor having a water pump connected directly to it. A larger solar-thermoelectric system, scaled up from the 50-watt version, is now under development and has been operated at part power. This unit will have a capability of up to 200 watts.

- ◆ **MILLION DOLLARS SAVED**—By substituting remotely controlled germanium and silicon semi-conductor rectifiers for motor generators in the new Baltimore, Maryland, copper refinery of the Kennecott Copper Corporation, an estimated million dollars was saved in electrical equipment, AIEE Engineers were told at a recent meeting.

The introduction of high capacity semi-conductor rectifiers of the germanium and silicon types fostered this design and arrangement. The estimated cost of semi-conductor rectifiers was less than 60% of the cost of motor generators. The indicated capital savings could not be ignored. Moreover, rectifiers could readily be remotely controlled. By centralizing controls and allowing production operators to control the rectifiers, attendants would not be required. Additional savings in bus work and d-c switch gear could be made by locating the rectifiers near the loads served.

- ◆ **ELUSIVE LIGHT**—The amazing destructive power of rapidly moving liquids was the central theme of a six-paper discussion at the Symposium on Erosion and Cavitation held during the Annual Meeting of the American Society for Testing Materials.

(Continued on Page 8)





## Banking convenience at its finest

Here . . . in handsome blue glazed brick, with striking aluminum grillework, patio, pool and attractive landscaping . . . is the newest of State Planters' 15 full-service banks. Certainly one of the most beautiful banks in Richmond, if not, indeed in all Virginia.

Inside, every facility has been provided to make banking convenient, enjoyable and comfortable for State Planters' clientele and personnel. And, as you might expect, in a bank as completely efficient and up-to-the-minute as this one, a leading contributor to the comfort factor is year 'round Acme air conditioning. Why expectable? Simply because Acme-system air conditioning equipment is the most efficient and up-to-the-minute on the market today.

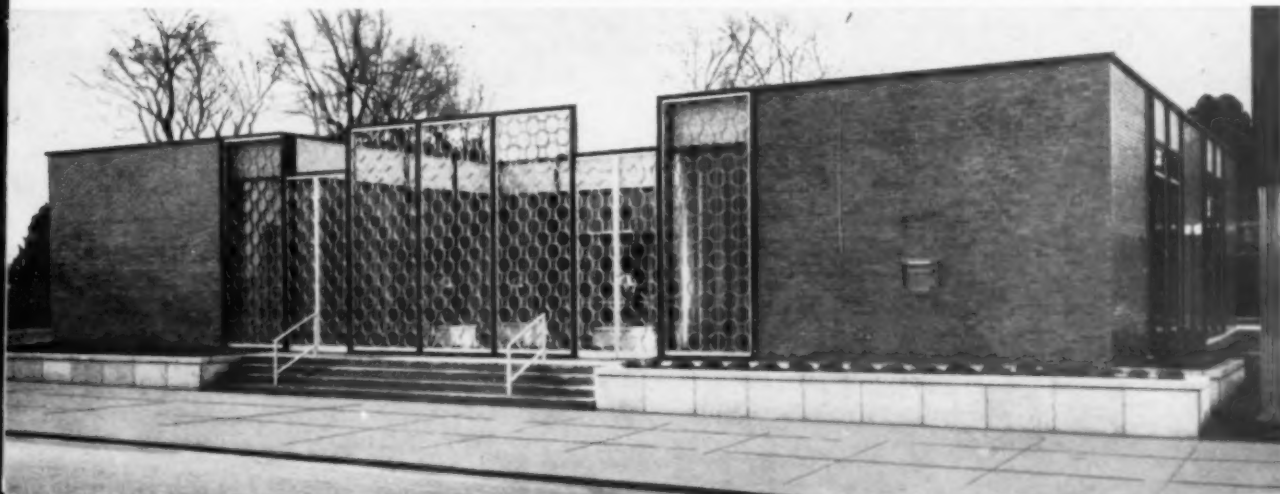
But let R. R. Hunter of J. Robert Carlton & Associates, consulting engineers on the job, tell you why Acme was selected . . . "Minimum space requirements in the mechanical equipment room necessitated selection and specification of a compact packaged

water chiller, inside type cooling tower, and a multi-zone air handling unit for the varied zones. To help keep first cost low, and to facilitate owner's future maintenance, factory assembled, tested and wired equipment was specified. It was also felt that the owner would benefit from having equipment of one reputable manufacturer . . . We chose Acme." When you've heard the Acme story you'll choose Acme, too. Get the complete story . . . call your Acme representative today.

**Acme** INDUSTRIES, INC.  
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MANUFACTURERS OF QUALITY AIR CONDITIONING  
AND REFRIGERATION EQUIPMENT SINCE 1919

Architects: Rawlings and Wilson • Consulting Engineers: J. Robert Carlton & Associates • Mechanical Contractor: W. A. Dagenhart & Sons



## Facts and Trends (Continued)

W. J. Rheingans, Allis-Chalmers Mfg. Co., reported that rapidly moving liquids often have sufficient power to create flashes of light when moving through turbines. These mysterious light flashes have never been fully identified. One hypothesis is that some of the energy of the moving water is used in the creation of heat at the impact point, and finally some of the energy either is converted directly into light or into static electricity.

- ◆ **BETTER PROTECTION**—National Fire Protection Association has announced several new bulletins to help in the fight against fire and accidents:

Hospital Electrical Services (No. 76-TR).....	23 pages, 50¢
Centrifugal Fire Pumps (No. 20).....	108 pages, \$1.25
Liquefied Petroleum Gases (No. 58).....	104 pages, 75¢
Hazardous Chemicals Data (No. 49M).....	54 pages, 75¢
Static Electricity (No. 77M).....	60 pages, \$1.00
Spray Finishing with Flammables (No. 33).....	44 pages, 60¢
Building Exit Codes (No. 101).....	256 pages, \$1.50
Fire Hazards of Materials (No. 704M).....	20 pages, 50¢
Pulverized Fuel Systems (No. 60).....	32 pages, 60¢
Carbon Dioxide Systems (No. 12).....	36 pages, \$1.00

Write: National Fire Protection Association, 60 Battery March St., Boston 10, Mass., for complete information, or order direct at prices listed.

- ◆ **GLASS BASE LIGHT BULB**—A new type of miniature indicator lamp has been announced by Westinghouse. The bulb is expected to find wide use in the electronic industries.

The compact bulb has no metal base or threads. Glass at the end of the bulb is formed into a flat wedge which is easily inserted into a vastly simplified socket—no turning or twisting is necessary. Electrical contact is made by two tiny wires which are crimped into the recesses in the wedge base. Since the bulb has no metal base, no cement is necessary. In ordinary bulbs, base cement frequently becomes loose when temperatures become high.

- ◆ **FIRE RESISTANT PANELS**—A new type of fire resistant ceiling panel capable of protecting structural steel joists from flame and intense heat for over three hours in a fire has been developed by the Armstrong Cork Company.

The new mineral product, called Fire Guard Nailing Panel, is designed for fast, economical installation in areas where a fire protective ceiling is required under steel bar joists. The panels can be fastened to standard type nailing channels with annular ring nails. The material costs generally less to install than ordinary metal lath and plaster fireproofing. It can be used as a finished fire protective ceiling in areas where ceiling appearance is not of primary concern.

- ◆ **NEW ALLOY**—Present and future trends toward more economical power have led to a vigorous search to find new materials to meet the ever increasing demands for higher temperatures and pressures. Several of these new materials were discussed at The International Nickel Company's recent Power Conference.

One of the new materials (IN-102) has a nickel-chromium base and is matrix-strengthened with several per cent each of columbium, molybdenum and tungsten. It is designed for long-time

(Continued on Page 10)

# Symbol of Progress

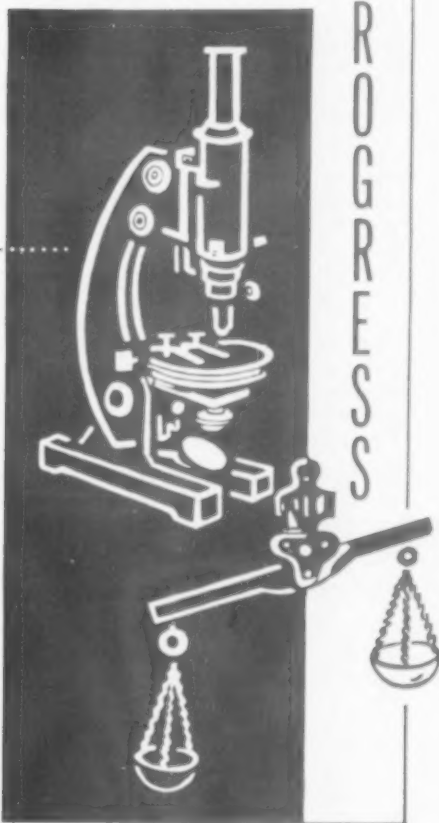
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SYMBOL OF P



The Symbol of Progress is the corporate image of FULBRIGHT LABORATORIES, INC., Charlotte, North Carolina.

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1201 SOUTH GRAHAM ST. ■ CHARLOTTE 1, N.C.

## Facts and Trends (Continued)

service at temperatures of 1200 F. Its rupture strength at that temperature is 2 to 2 1/2 times higher than materials currently used in such applications. While not yet commercially available, IN-102 has been produced in a variety of mill forms and is presently in the field trial stage.

- ◆ **ENGINEERING EDUCATION**—Paul H. Robbins, Executive Director of the National Society of Professional Engineers, told a Senate Education Subcommittee that "the real problem facing the nation with respect to engineering manpower lies at two poles—the need to expand and stimulate graduate education, and the need to encourage and support technician education programs." He said the Administration's proposed undergraduate scholarship program places the emphasis in the wrong area. An extensive undergraduate scholarship financing program would place the emphasis on the need for more students, at a time when enrollments in U. S. colleges and universities are already at an all time high.

"We believe," he said, "that the primary concern of the Federal Government should be with improving the quality of our college students, not their quantity. The greatest need is for post-graduate education and fellowships, rather than undergraduate scholarships. Improvement in quality can be assured through expanded opportunities for postgraduate education.

Mr. Robbins also pointed out the growing need for encouragement and support of programs to develop engineering technicians. Improved efficiency in utilizing engineering manpower is directly related to the extent to which trained engineering technicians are available to relieve the engineer from routine, repetitive tasks. By the judicious use of technician personnel, such as engineering aides or assistants, the professional engineer can be given opportunity to devote more time, effort and ability to activities nearer the highest level of his competence. The result will be a commensurate growth in the professional-level output.

- ◆ **MOLDED PLASTIC BOTTLES**—A light, trim, unbreakable and corrosion resistant 13-gallon plastic bottle for industrial and consumer storage of liquids is one of the first commercial products of the recently developed plastic technology called polyethylene powder molding.

The new container, a product of Industrial Can Company, is expected to find widespread use in storage and transportation of many industrial liquids, particularly acids and other highly corrosive substances produced and used in the chemical industry. It is designed to replace the heavy, bulky glass carboys currently in such use. U. S. Industrial Chemicals Company's "Microthene" (finely divided polyethylene) is used in the production of the bottles.

- ◆ **VHF HELPS TROUBLESHOOTERS**—Very high frequency (VHF) radio networks are being utilized to locate remote outages of electrical power. The system also can be used to locate failures in pipeline systems. Martin Cooper, Motorola, Inc., presented a paper on this subject at the annual AIEE meeting.

The system "combines efficient usage of existing equipment and radio channels with simplified monitoring equipment to provide rapid reports of outages in the power utility services. Upkeep and interference with voice communications are minor, and easily read records of outage locations will permit rapid remedial action to be taken with significant savings and an improvement in service."

(Continued on Page 12)



ONE OF A SERIES OF CHATS ABOUT THE  
CONSERVATION AND CONTROL OF HEAT

# SARCO TOPICS

## WHY THE BIG STRAIN?

It's tough to keep gases and liquids "clean" as they run through a pipe. They drag impurities along, which can make even plain water a trouble maker, let alone more sophisticated fluids. That's because water, as a liquid or steam, is intimately involved with vital equipment like steam traps, temperature regulators, or tools. Meters, burners, nozzles, and pumps, too.

By this time you must realize we're going to talk strainers, don't you? A good, stout subject, of interest to all who feel production belongs up and costs belong down. Sarco makes strainers for water and condensate, steam, oil, air, gas and other piped fluids . . . dozens of different sizes and types and ratings of strainers to match every application need. Even our line of plain and simple strainers is built for super service. These are pipeline strainers, types AT, BT, and CT, which are designed for 250, 250 and 600 psi non shock, respectively, and 475°, 450° and 750° F. temperature ratings. Standard screens are heavy-gauge, perforated brass or stainless steel. Sarco specializes in screens that can withstand abnormal pressure differentials created by accumulated sediment.

Next, Sarco's flanged strainers, type D. These come in larger sizes, right up to 12", and are available in standard or extra heavy types.

And finally, Sarco scraper strainers, manual or motorized. These are the really eye-popping models, and if you can't use one yourself — well — you'll just have to get your kicks elsewhere.

Examples? Take Inland Steel Company at East Chicago, which gets water from Lake Michigan to cool its large air conditioner condensers. The water used to pass through traveling screens, but still contained fine sand. Clogging! Heat under collars! Frequent cleaning required! Sometimes practically no

air conditioning on hot days. (Isn't that always the way?)

The Inland Steel people installed Sarco Rotary Scraper Strainers, Type VRS, which incorporate a hand-operated helical scraper knife within the cylindrical strainer screen. A few turns of the crank at regular intervals, and the sand is scraped off the screen, blown clear, and discharged at pressure through a manual valve to waste. Dismantle the strainer? Shut down the unit? Not this strainer!

Now, as long as we've come this far, it's only a hop and a skip to the Firestone Tire and Rubber Co. in Akron, Ohio, who also use water in tremendous quantities. They circulate it through tire presses and a cooling tower, and there's no nonsense about it. It has to be clean or damage to equipment could be downright catastrophic. When the plant



modernized and enlarged, Firestone replaced their 4" Sarco hand-operated scraper strainer, type VRS, with a larger Sarco 8" model. And while they were about it, they got the motor-operated type, for continuous cleaning.

When we say that companies like these want the insurance of a Sarco strainer, it sounds like advertising, but sometimes there just isn't any other way to put it. Sarco strainers are insurance at low cost on the operation of your high cost equipment. So when we ask if you have lumps in your pumps, or worries over your slurries, we're serious. We've heard everything in the straining line, so why not write us for literature and answers to those special problems you have.

## A T-44 IS THE BEST POLICY

Sorry, but we can't leave the subject of insurance without bringing to your attention one of the best little insurance policies any company requiring cooling control could invest in. It's the self-powered Sarco T-44 Automatic Cooling Control. No compressed air or electricity is needed, but its advantages are best described in terms of three different plants of just one Sarco customer — Revere Copper and Brass, Inc.

Revere-Baltimore, Md., has cut water use 40 to 50% with T-44's. But in addition to former water waste, Revere had even more problems: possible wet air from uncontrolled cooling of compressor aftercoolers, plus sweating compressor cylinders; variations in viscosity of hydraulic oil and bearing oil; gas generator water waste; unreliability of manual shut-off of water supply when machines were down.

If your ears perk up in sympathy at mention of any of these problems, the results of Revere's cooling control program should bring you to full attention. One large compressor that had gulped 2400 gallons per hour now takes only 420 gallon sips. In addition all the problems itemized above were solved. T-44's are now used on their air compressors, gas generators, and hydraulic oil systems. At Revere-Riverside, Cal., water savings of 50% were experienced, and at Revere-Rome, N. Y., substantial savings were made too.

But after all, wasting water is only one way of wasting money, so let's go on to another matter of interest: the evils of manual control. When cooling water is controlled by hand the temptation to leave the valve nearly wide open is almost overpowering, in order to play it safe if the load varies. Result: overcooling, of course. And varying the flow runs the risk of undercooling. In either case, lowered process efficiency. Answer: The automatic Sarco T-44, which can't be tempted, is meticulously honest, unsentimental, and plain inhumanly practical when it comes to cooling control. You really ought to write for literature. T-44 is your best policy.

## SOUTHERN COMFORT

It's true what we've said all along about Dixie: Sarco is well represented in the South. In fact, there are Sarco representatives in 29 southern cities. This means that your pesky problems of conserving and regulating heat have available solutions nearby. No room for addresses and phones here, but here are the southern Sarco cities and the organizations to call: Alabama, Birmingham, Bratton Sales Engineers; Arkansas, Little Rock, J. L. Brown Sales Co.; D. C., Washington, Sarco Company Inc.; Florida, Pensacola, Bratton Sales Engineers; Tampa, O. H. Howell Mfrs. Agent, Inc.; Georgia, Atlanta, John F. Templeton Co.; Louisiana, Shreveport, J. W. Cherry Company; New Orleans, Frank A. Birdsong; Maryland, Baltimore, J. E. Perkins Corp.; Mississippi, Jackson, Robert Porter; Missouri, Kansas City, Smith Steam Spec. Co., Inc.; St. Louis, Sarco Co., Inc.; North Carolina, Charlotte, Hoffman & Hoffman Co.; Raleigh, Hoffman & Hoffman Co.; Oklahoma, Tulsa, Vanco Engineering Co.; South Carolina, Columbia, Hoffman & Hoffman Co.; Greenville, Hoffman & Hoffman Co.; Tennessee, Knoxville, Walter F. Sutton; Texas, Dallas, Gilbert Engineering Co., Inc.; El Paso, Engineered Equipment Inc.; Ft. Worth, Gilbert Engineering Co., Inc.; Houston, Esch and Associates, Inc.; San Antonio, L. S. Pawkett & Co.; Virginia, Richmond, Robert S. Lovelace Co.; West Virginia, Charleston, Angus Gillis & Son.

*Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate.*

7751

**SARCO COMPANY, INC., 635 MADISON AVE., NEW YORK 22, N.Y.**

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

# SARCO

## Facts and Trends (Continued)

- ◆ **MORE ABOUT FUEL CELLS**—A model of a futuristic monorail system that will be powered by converting chemicals directly into electrical energy in fuel cells was exhibited by Exide Industrial Division at the National Chemical Exposition, as part of a display demonstrating the exciting future possibilities of various fuel-cell power sources.

Exide points out that considerable progress has been made in overcoming some of the numerous difficulties in perfecting fuel cells, but with much yet to be learned, extensive commercial development probably is some time off. Exide has also produced an operating model of a fuel cell powered midget automobile, and a full size fuel cell has been developed experimentally for electric industrial trucks.

- ◆ **GAS TURBINE**—Phillips Pipeline Company, Bartlesville, Okla., has ordered a Solar Aircraft Company 1100 hp gas turbine engine to be used with a liquid products pump in its pipe line operations.

The engine, a two-shaft, diesel-fuel burning version of the Saturn engine, will be used to boost pressures at various sites. A new type Carter pump will be driven by the turbine. This application is a big departure from standard units and reduces the overall length of the pumping package from 178 to 98 inches. The result is increased portability for remote location operations. The unit will deliver 1,900 gallons per minute at a 2,500 foot head.

. . . . . REPRINTS AVAILABLE . . . . .

Write the editors of SPI for small quantities of the following at no charge.

- **SEGC 1,000,000 KW PLANT**—A 16-page folder describing this large new Alabama plant, serving Alabama Power Co. and Georgia Power Co., is a combination of two technical articles from SPI's September and November, 1960, issues.
- **ELECTRICAL DISTRIBUTION FOR LARGE PLANT**—An 8-page special report prepared jointly by Director of Facilities, the Consultants, and the Contractor—describing plans and installation of all electrical services for new plant of Texas Instruments Inc., Dallas, Texas.
- **HOW EPOXY CAN SERVE YOU**—4 pages. Tells exactly how 10 separate repair jobs were handled and describes several epoxy mixes that are good for maintenance jobs.
- **MATERIAL HANDLING EQUIPMENT**—An 8-page special booklet prepared by the editors of SPI from equipment manufacturers' releases. Lists 69 catalogs and describes 22 items of new equipment.
- **THERMAL INSULATION DIRECTORY:**  
Tells where to get service and technical data..... 6 pages
- **WATER TREATMENT DIRECTORY:**  
Tells where to get service and technical data.....12 pages
- **AIR & GAS CLEANING DIRECTORY:**  
Tells where to get service and technical data.....16 pages
- **COMBINED GAS-STEAM CYCLE PERFORMANCE:**  
First year report on new plant, West Texas Utilities Co.... 6 pages
- **PAINTS & PROTECTIVE COATING DIRECTORY:**  
Tells where to get service and technical data.....12 pages
- **ORIFICE METER INSTALLATIONS**—Tells what the plant man needs to know about installation to get accurate, dependable service.

# YOU CAN COUNT ON POWELL VALVES

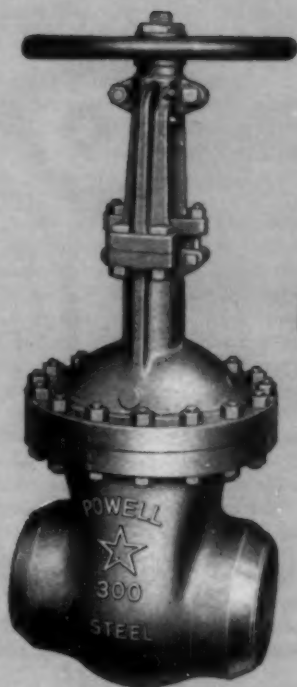
Performance proves it, year after year—you can count on Powell Valves to help you solve the toughest flow control problems of temperature and pressure found in power plants today.

This truly dependable performance results from many things—among them Powell's engineering know-how, accumulated during 115 years of valve manufacture, and the consistent use of quality

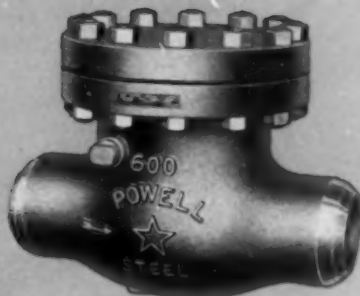
materials, quality controlled.

Then, too, you can count on getting the Powell Valve you need, when you need it. That's because Powell maintains a network of distributors backed up by factory inventories, warehoused "ready to go."

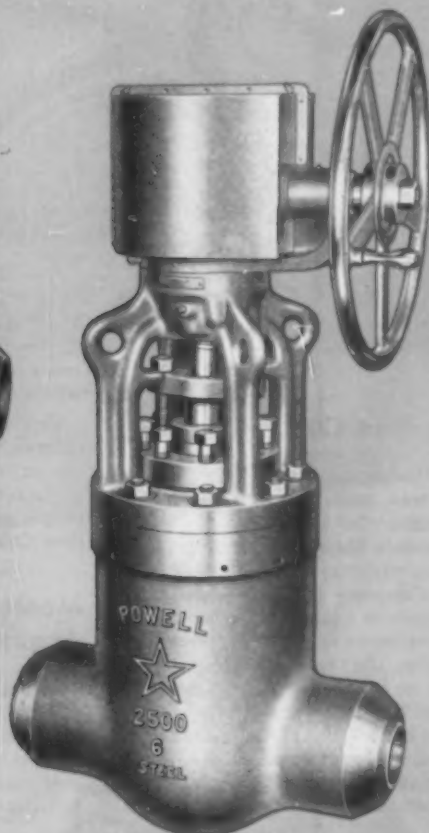
Get the full story from your nearby Powell Valve Distributor, or write us direct . . . The Wm. Powell Company, Cincinnati 22, Ohio.



300-pound Steel Gate Valve—Fig. 3003 WE. Bolted flanged yoke-bonnet. Outside screw rising stem. Interchangeable solid or split wedges, renewable seats. Sizes, 1" through 30".



600-pound Steel Horizontal Swing Check Valve—Fig. 6061 WE. Bolted cap, renewable seat and disc. Has full flow area when valve is fully open.



2500-pound Steel Pressure Seal Gate Valve—Fig. 125003 WE. Enclosed bevel gears facilitate operation. Valves can also be supplied with spur gearing or motor operators for remote control.

See our catalog in Sweet's

*115th year of manufacturing industrial valves for the free world*

**POWELL STEEL VALVES**

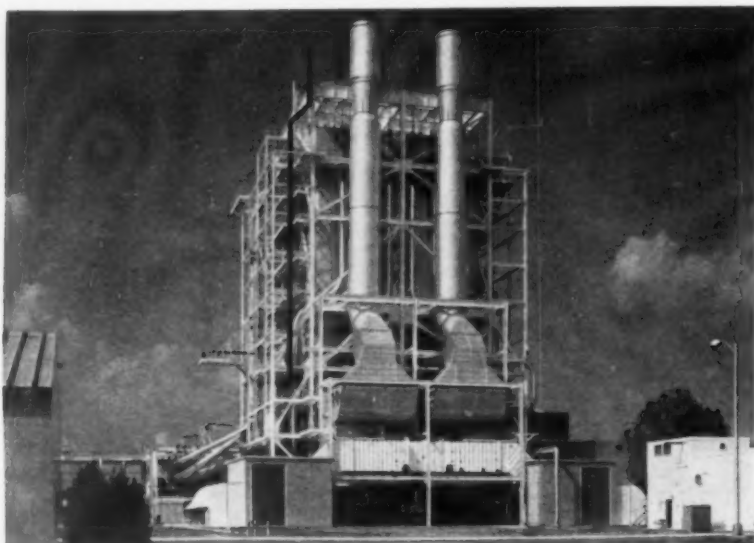
THE WM. POWELL COMPANY CINCINNATI 22, OHIO





## the SOUTH—SOUTHWEST

more power . . . more plants . . . more money



### "Porcelain City"

Just north of New Orleans on what was once the Little Gypsy plantation, the Avoncraft Division of Avondale Shipyards, Inc. has been working with the Louisiana Power & Light Company in building what is purported to be the most advanced steam-electric generating plant in existence. Its exact location is at Montz, on a 330-acre tract on the Mississippi River.

This 247,000 kw power plant, capable of fully automatic operations, incorporates corrosion resistance and architectural beauty through the use of Avoncraft porcelain enameled steel. The 150' by 61' by 56' steam generator is lagged with porcelain enamel.

A water treatment plant is constructed of load-bearing porcelain enamel. A porcelainized sub-station control house has been erected. A switchyard relay house, a maintenance operator's laboratory and two fan houses all are of porcelain enamel. Completed some time ago were a porcelain enameled warehouse and a storekeeper's office, as well as eleven fire hose houses. The predominant color used is shrimp pink.

This is not the first time porcelain enamel by Avoncraft has been used for such a purpose. Other jobs include Louisiana Power & Light Company's plants at Ninemile Point near New Orleans, and at Sterlington, La.

### Monsanto to Build Augusta Plant

Monsanto Chemical Company's Inorganic Chemicals Division will begin construction early next year of a plant at Augusta, Ga., to produce raw materials for the detergent, fertilizer and metal treating industries.

The plant, which is scheduled to go on stream early in 1963, will be located on a site of approximately 100 acres five miles south of Augusta's city limits. Neither cost nor capacity has been announced.

Initially, the plant will produce phosphoric acid and sodium tripolyphosphate. Sodium tripolyphosphate is one of the main building blocks used in manufacturing household and industrial detergents.

Manufacturing units for additional products will be constructed at the location as market demands make such units desirable.

### PLANT PERSONNEL

Dravo Corporation has named **Charles E. Kaufman** as manager of its large marine repair facility to begin operations at Baton Rouge, Louisiana, later this year. **William C. Keating** will be superintendent.

**W. K. A. Ferguson** is general manager of foil and printing at Reynolds Metals Company's Bellwood, Virginia plant, where a major expansion is now in progress. . . **Daniel S. Cvacho** has been promoted to the newly created position of director of packaging engineering for Reynolds Metals Company at Richmond.

**John M. McGurn** has been appointed operating manager for Virginia Electric & Power Company at Richmond, succeeding **Walter J. Matthews** who recently resigned. Mr. McGurn joined VEPCO in 1941, and six years later was made superintendent of Possum Point Power Station. His most recent position was Norfolk district manager, where he has now been replaced by **Allen S. Hadfield**. Mr. Hadfield was previously system superintendent-distribution.

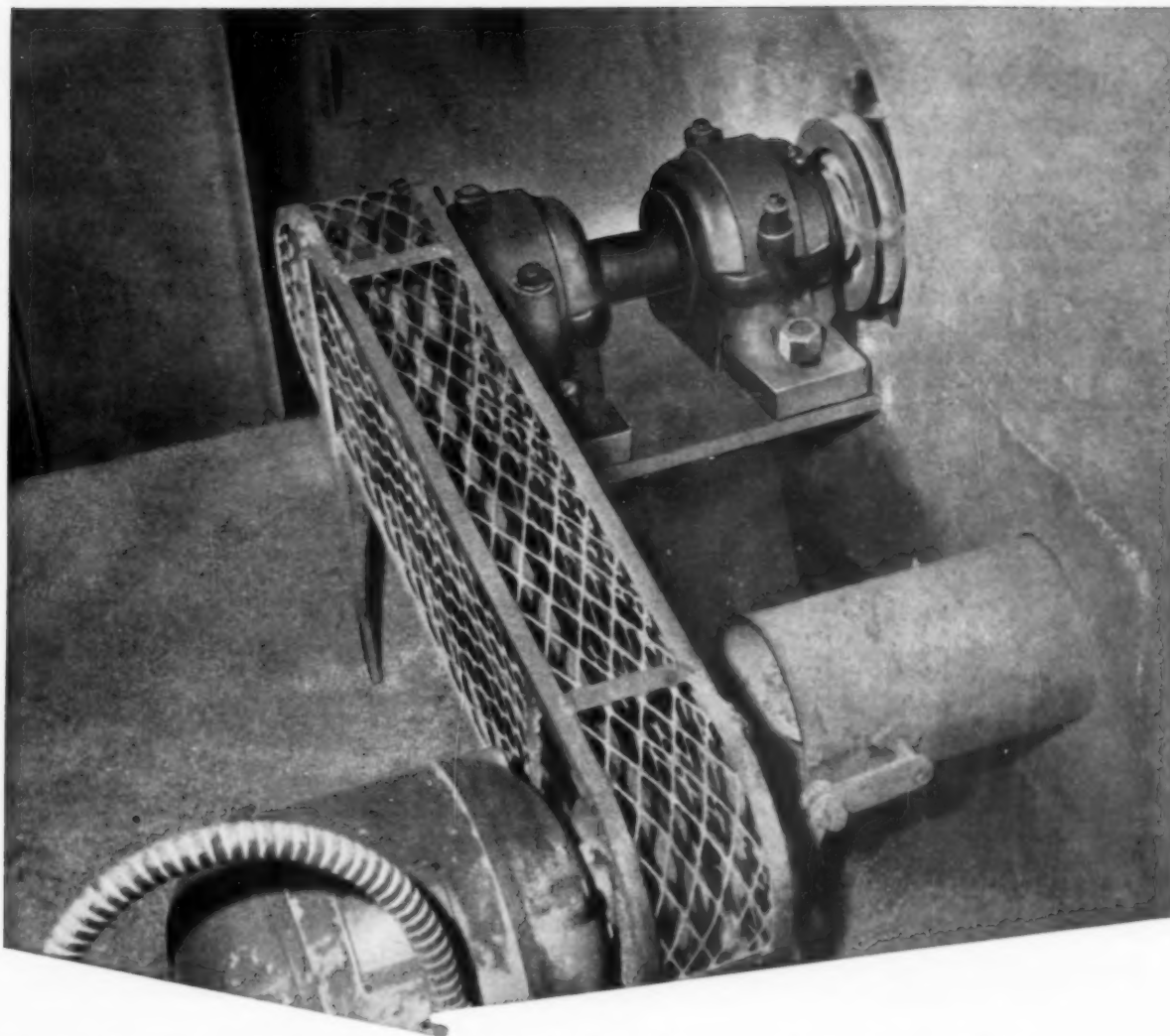
Manager **Earle H. Fulford** heads the Warner Lewis Company's new Industrial Division at the Tulsa, Oklahoma, filter fabricating plant.

### Connors Steel Opens New Orleans Works

Connors Steel Division, **H. K. Porter Company, Inc.**, has opened a reinforcing bar fabricating facility in New Orleans, Louisiana. The new plant is located on a two acre tract at 2001 St. Ferdinand Street, which is also the address of the local sales office.

Reinforcing bars for the New Orleans operation will be supplied from the steel mills operated by Connors Steel Division at Birmingham, Alabama. The Division produces cold finished bars, hot rolled merchant bars and bar shapes, concrete reinforcing bars, and special sections.





## Galled and frozen shafts eliminated... a costly maintenance problem solved!

Twenty special, high temperature recirculating fans installed on a furnace in a brick plant were a constant expense and source of trouble due to the failure of the water cooled, babbitted bearings.

Often, too, the shafts would gall and freeze in the bearing and shaft replacement was an expensive procedure.

Our bearing engineers suggested these bearings be replaced with anti-friction pillow blocks. Conversion cost

was only \$150 compared with \$175 to repour the babbitted bearing. Another plus was the elimination of the water cooling towers. After three years of service, no bearing failures have occurred and maintenance problems are eliminated.

You may not make brick, but if you have any kind of bearing problem — we are ready to help you, day or night. Just call the branch nearest you.

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### **DIXIE BEARINGS, INC.**

**ARKANSAS:** Little Rock • **FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • Augusta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge  
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Knoxville • Memphis • Nashville • **VIRGINIA:** Norfolk • Richmond • Roanoke

## **FUTURE EVENTS of Engineering Interest**

**Oct. 2-3: 29th Annual Meeting. Engineers' Council for Professional Development.** Sheraton Seelbach Hotel, Louisville, Ky. Dr. R. C. Ernst, Local Chm., Dean, Speed Scientific School, University of Louisville.

**Oct. 3-4: Coal Technology Conference.** Dinkler-Tutwiler Hotel, Birmingham, Ala. Southern Research Institute, 2000 Ninth Ave. South, Birmingham.

**Oct. 4-6: ASME Process Industries Conference.** Shamrock Hilton Hotel, Houston, Texas. Sec'y. ASME, 345 East 47th St., New York 17, N. Y.

**Oct. 5-7: AIME-ASME Joint Solid Fuels Conference.** Dinkler-Tutwiler Hotel, Birmingham, Ala. Sec'y. ASME, 345 East 47th St., New York 17, N. Y.

**Oct. 9-11: 17th Annual National Electronics Conference & Exhibition.** International Amphitheatre and Hotel Sherman, Chicago, Ill. John S. Powers, Exhibits Chm., 228 N. LaSalle St., Chicago 1.

**Oct. 19-20: ASQC 16th Midwest Con-**

**ference.** Chase-Park Plaza Hotel, St. Louis, Mo. Sec'y, American Society for Quality Control, 50 Church St., New York 7, N. Y.

**Oct. 23-27: ASM Metals Show & Annual Fall Conference of Society for Nondestructive Testing.** Cobo Hall, Detroit, Mich. Sec'y, American Society for Metals, Metals Park, Novelty, Ohio.

**Oct. 24-27: 1961 Conference & Exhibition, South Central Region.** NACE, Shamrock Hotel, Houston, Texas. T. J. Hull, Exec. Sec'y, NACE, 1061 M&M Bldg., Houston.

**Nov. 27-Dec. 1: 28th Exposition of Chemical Industries.** New York Coliseum. E. K. Stevens, International Exposition Co., 480 Lexington Ave., New York 17, N.Y.

**Nov. 27-Dec. 1: Regional Conference, Southeast Region.** NACE, Key Biscayne Hotel, Miami, Fla. T. J. Hull, Exec. Sec'y, NACE, Houston.

**Jan. 29-Feb. 2, 1962: AIEE Winter General Meeting & Electrical Engineering Exposition.** New York Coliseum. Reber-Friel Co., Mgr., 117 S. 17th St., Philadelphia 3, Pa.

## **New Alabama Distribution Center for Noland Co.**

**Noland Company, Inc.,** recently opened its new \$200,000 mechanical distribution center at Decatur, Alabama.

The new service center, built for the wholesaling of plumbing, heating and industrial supplies, was designed as an integral part of Decatur's in-

dustrial development program. It is the latest branch building completed by the Noland Company, whose 37 branches in nine Southeastern states give it rank as the nation's largest independent wholesaler of mechanical equipment. The company's general offices are at Newport News,

## **INCO Expansion — Huntington, W. Va.**

An \$8,000,000 expansion of tubular production facilities is being completed by the Huntington Alloy Products Division of **The International Nickel Company, Inc.,** at Huntington, W. Va.

Steam generator and feedwater heaters for nuclear and conventional power plants, as well as jet aircraft and missile engine applications, are currently served by many Huntington alloys. Various nickel alloys, nickel-copper alloys and nickel-chromium alloys are being extruded and cold drawn into tubing ranging up to 85 feet in length.

In step with increased productive capacity has been the expansion of Huntington's quality-control program. Quality control starts while the metal is still in the melting furnaces. A sample of the melt is rushed to the laboratory for spectrographic analysis, and this same care is exercised throughout every step of the process. A final quality verification is available by ultrasonic, electromagnetic and dye penetrant tests, in addition to the conventional checks.

## **Brunswick Expansion**

**Brunswick Pulp & Paper Company** has awarded Stone & Webster Engineering Corporation the principal construction contract in a \$35,000,000 expansion program for the company's production facilities in Brunswick, Ga.

Total production of the expanded facilities, scheduled for completion in January, 1963, will be approximately 1,120 tons of pulp per day.

The contract calls for the construction of buildings and the installation of equipment and services to complete the current expansion of the existing pulp mill constructed in 1937.

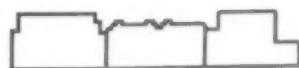
The work on the 550 ton per day bleached kraft mill extension will include new power and recovery boilers, wood and chip handling facilities, equipment for bleaching, washing and screening operations. The new 236 in. Fourdrinier paperboard machine will permit the production of bleached paperboard in the range of 400 tons per day. The mill has been designed to produce pine and gum pulps separately and continuously.





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***Available January 1, 1962:  
All-inclusive  
Turbine-Generator  
Service Contract  
from Westinghouse***



## ***Let Westinghouse service your***



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***You can save all these ways when you have a Westinghouse Turbine-Generator Service Contract:***

- Fuel costs may be minimized.***
- Unscheduled outages may be reduced.***
- Trained crews cut outage time during overhaul.***
- Planning techniques cut overhaul time by pre-shutdown ordering of necessary parts.***

***Here's what Westinghouse Turbine-Generator Service Contract gives you...***

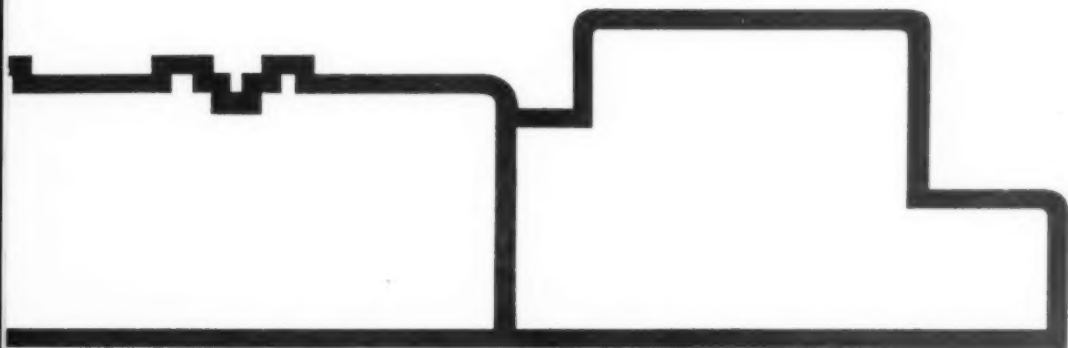
***As soon as you approve the contract, Westinghouse as-***

***signs an engineer to your turbine-generator. As a consulting specialist in turbines and generators, he'll call at quarterly, semi-annual or annual intervals, whatever your contract provides. He'll check your operating records, inspect your turbine-generator equipment, and advise plant personnel on any operating problems. Finally, he'll submit a detailed report of observations, conclusions and recommendations.***

***The Westinghouse Turbine-Generator Service Contract is not intended to provide routine***



## ***turbine-generator... and save***



***maintenance. The service complements the activities of your regular maintenance department on a scheduled basis.***

***At regular intervals, you'll receive a confidential TGSC Service Bulletin from Westinghouse. This bulletin contains reports of operational and maintenance experience of other turbine-generator users. It lets you profit by their experience.***

***Your contract is flexible and can be tailored to your individual requirements. For example, major inspection and overhaul***

***is provided for in your original contract, based on a detailed outline of all work to be performed. Or your contract can be written to provide for specific work as required.***

***You determine your needs—Westinghouse does the work.***



## Turbine-Generator Service Contract

### ***A typical schedule of inspection by a Westinghouse turbine-generator specialist will include:***

Periodic visits to the plant location for a complete review of historic and present operational data, plus consultation on present operational procedures as related to current needs.

1. Discuss with operating people the past performance and history of the turbine-generator, noting any malfunctions.
2. Check in detail governor operation and overall performance.
3. Check any record of spindle movement for possible wear of component parts.
4. Look for abnormal symptoms.
5. Detect unusual operational conditions and make definite recommendations to remedy them.
6. Discuss with and advise personnel on the most efficient and economical operation for the turbine-generator under current operating conditions. This keeps new personnel up to date on proper operating methods for the particular machine.
7. Recommend new operating methods and procedures as required.
8. When an outage is necessary, the Westinghouse engineer will assist in planning the work schedule.
9. Make a detailed written report of observations, conclusions and recommendations.

### ***A typical full-scale turbine-generator inspection by Westinghouse will include:***

1. Removal of insulation, cylinder covers, blade rings, gland seal rings, spindles, and other components requiring inspection and cleaning.
2. Inspection and cleaning of all blading, seal strips, bearings, main oil pump, governor pump and thrust pedestal seals.
3. Cleaning of spindle and stationary blading where necessary.
4. Inspection and cleaning of control system.
5. Inspection and cleaning of steam chest valves, intercept valves, reheat stop valves and throttle valves.
6. Magnaflux or zygo examination of spindle, rotating and stationary blading as determined necessary.
7. Inspection and adjustment of turbine-generator supervisory instruments.
8. Inspection and testing of exciter, bearing brackets, generator rotor, bearings and hydrogen seal rings.
9. Visual inspection and dielectric absorption, voltage leakage and slot discharge tests of all stator parts and windings.
10. Testing of insulation resistance on rotor, exciter and other parts.
11. Varnishing of windings as required.
12. In this type of contract, the Westinghouse engineer will plan for the work, schedule the turbine-generator crew and follow the work to completion. No need to borrow work crews from other plants to carry out the inspection and overhaul. Westinghouse does the whole job when you have a Turbine-Generator Service Contract.

The Turbine-Generator Service Contract is available in the Westinghouse Southeastern Region. For complete details, contact your Westinghouse sales representative—or write to Westinghouse Electric Corporation, P.O. Box 4808, Atlanta 2, Georgia.

*You can be sure . . . if it's Westinghouse*



**Westinghouse**

### **TVA Paradise Station Drakesboro, Kentucky**

Two of the world's largest steam generating units will be controlled by Rockwell - Republic solid-state electronic boiler control systems upon completion of their installation at the **Tennessee Valley Authority's Paradise Station, Drakesboro, Ky.**

Receipt of the prime contract for the automatic combustion, feedwater and superheat steam temperature control systems, analog instrumentation and digital computer for Paradise Station Units 1 and 2 was announced by Republic Flow Meters Company, Subsidiary of Rockwell Manufacturing Company.

TRW Computers Company, a division of Thompson Ramo Wooldridge Inc., will provide two digital control computers as a part of the Republic contract.

The system will automatically control the turbine generators, sequence monitor the steam generators, and will sequence cold start, hot restart, normal shutdown, or emergency shutdown of the units. In addition, the system will perform sensor

scanning and alarm monitoring, data logging, trend recording and performance calculations.

The two units will produce a total of 1,300,000 kilowatts of power, and will be the largest power generating installations in the United States. The first unit is scheduled to begin operation in the fall of 1962; the second is scheduled for mid-1963.

Late last year, TVA awarded its first contract incorporating an analog boiler control system and a digital computer to Republic-TRW. That installation, now underway at the Colbert Steam Plant, Tuscumbia, Ala., is scheduled to begin operation in mid-1962. The single boiler-turbine-generator at Colbert Unit 5 will be rated at 500 megawatts.

### **South Louisiana Plant Addition**

A \$50,000 addition to double the recovery of propane and butane from natural gas has been completed at a South Louisiana Production Co. natural gas processing plant at Jeanerette, La. The company is a wholly owned subsidiary of **Central Louisi-**

**ana Electric Co., Inc.**

The \$310,000 gas plant has a processing capacity of 25 million cubic feet of gas per day.

The new addition is a low temperature refrigeration facility designed to chill the inlet gas stream to a temperature of 10 F, which is instrumental in doubling the recovery of propane and butane from the natural gas.

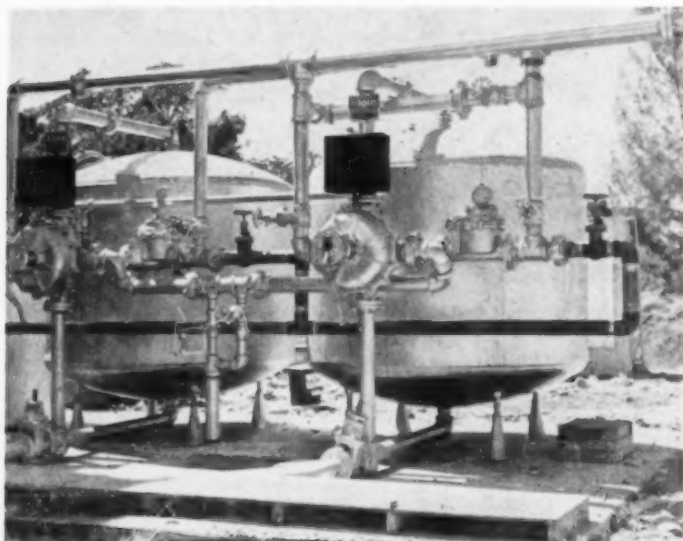
Products of the plant are a propane and butane mixture and gasoline. The propane and butane mixture is sold to the General Gas Corp. for distribution to customers, and the gasoline is sold to Mobil Oil Co. for blending in various oil refinery products.

Completed in 1959, the Jeanerette plant was originally designed for the per-day extraction of about 7,000 gallons of natural gasoline and about 4,500 gallons of propane-butane mixture. Fully automatic, it can be operated through microwave impulses initiated by dispatchers at CLECO's Coughlin power station at St. Landry, about 100 miles from the gasoline plant.

As a second venture by the company into the gas processing industry, South Louisiana Production Co. and Tidewater Oil Co. are building a natural gas processing plant to cost in excess of \$1 million at St. Landry.

### **Sea Water Supplies Salt for Softener**

Soft water, without the expense of salt for periodic reconditioning or "regenerating," is provided by the water softener equipment pictured here. Salt requirements are supplied by sea water piped from the ocean, which results in a sizable saving. This equipment at the Jack Tar Grand Bahama Club was supplied by Elgin Softener Corporation, and installed by Clarence Coston Inc. of West Palm Beach, Florida.



### **Reynolds Metals Plant Nears Completion — Va.**

A program which will increase the capacity of **Reynolds Metals Company's** plant at Bellwood, Va. by 50 per cent, is nearing completion. Prompted by growing demand for aluminum foil packaging, the expansion includes a 70,000 square foot addition to the plant building and installation of three additional presses for printing foil packaging materials of all types.

The building addition, costing more than \$400,000, increases the plant's size to 320,000 square feet — more than seven acres under one roof. The new space, in the form of two bays at the building's rear, will be used for production and storage.

Like the rest of the building, the addition will have walls and roof of Reynolds corrugated aluminum sheet over a steel framework. Design work was by the Reynolds central engineering division. General contractor is Daniel Construction Company, Richmond.

# INDUSTRY SPEAKS



## Exposition Forecasts Better Chemical Production

**THE 28TH EXPOSITION** of Chemical Industries will be held at the New York Coliseum, November 27 to December 1.

### More Production at Lower Cost

The chemical process industries are rapidly advancing along the road to increased production at lower cost to the consumer through streamlined equipment, and the shape of things to come will be sharply outlined by the new concepts in method, materials, and mechanisms on display at the Exposition, many of them startlingly new.

Major fields of interest at the Coliseum will lie in new structural materials, and in the details of new and improved equipment for every chemical processing need. Particular attention will be drawn to equipment that combines, or even eliminates, intermediate processing steps.

The range of structural materials is rapidly expanding under the pressures exerted by researchers and process developers to force back the barriers that limit extreme pressures and temperatures and permit corrosion to levy its exorbitant tax on investments.

For example, one display at the Exposition will be devoted to the metallurgical, chemical and agricultural uses of cobalt. To demonstrate the versatility of the metal, samples will be shown of magnets, springs, dental alloys, castings and cutting tools; also glass-to-metal seals, driers for paints, varnishes and inks, as well as catalysts and cobalt "bullets."

A new ceramic-metal vessel for high temperature reactions will be exhibited for the first time. Among several displays of graphite shaped and lined heat exchangers, pumps, valves and other equipment will be a pre-stressed, graphite-lined steel vessel, shown for the first time in the United States.

Plastic formulations are entering increasingly into chemical equipment, revealing a fast growing influence on all mechanical design. Among other ex-

amples of components will be fabricated ducts, hoods, stacks and tanks of plastic materials with glass fiber reinforcement; Teflon impregnated glass fabric bearings for high temperature and anti-corrosion applications; Penton coatings for metal surfaces, ceramic coatings for seals and shafts, and many others.

A recent development is the processing of a Teflon resin into spiral tubing for a wide variety of low pressure flexible connections and transfer operations. Featured along with this new line will be a complete line of piping components, molded bellows, thermowells, nozzle liners, raschig rings and other plastic specialties.

Specially developed for electrochemical processing is a line of filters, pumps, agitators and skimmers incorporating epoxy pumps and polypropylene pump chambers with titanium shafts. Such equipment is rated to handle chromic acid up to 200 F.

Considerable interest will be developed by various methods of combining successive stages of treatment in closely integrated operations, and occasionally abridging intermediate steps in a single, perfected final stage.

### Streamlining and Automation

An example of process streamlining will be a new 60-hp, 10-in. pipe line mixer designed for working pressures up to 300 psig, which will be offered as opening a new field for continuous emulsification, blending and refining on a large scale.

A source of industrial bacterials and fungicides will introduce a new process for mildew-proofing textiles, and a new, highly active non-mercurial toxicant for the paper and pulp industry, as well as a phenyl-mercurial ingredient for the paint and allied industries that is termed the least toxic material of its kind.

The Exposition will continue under the management of the International Exposition Co., 480 Lexington Ave., New York 17, N. Y. E. K. Stevens is manager of the Exposition.





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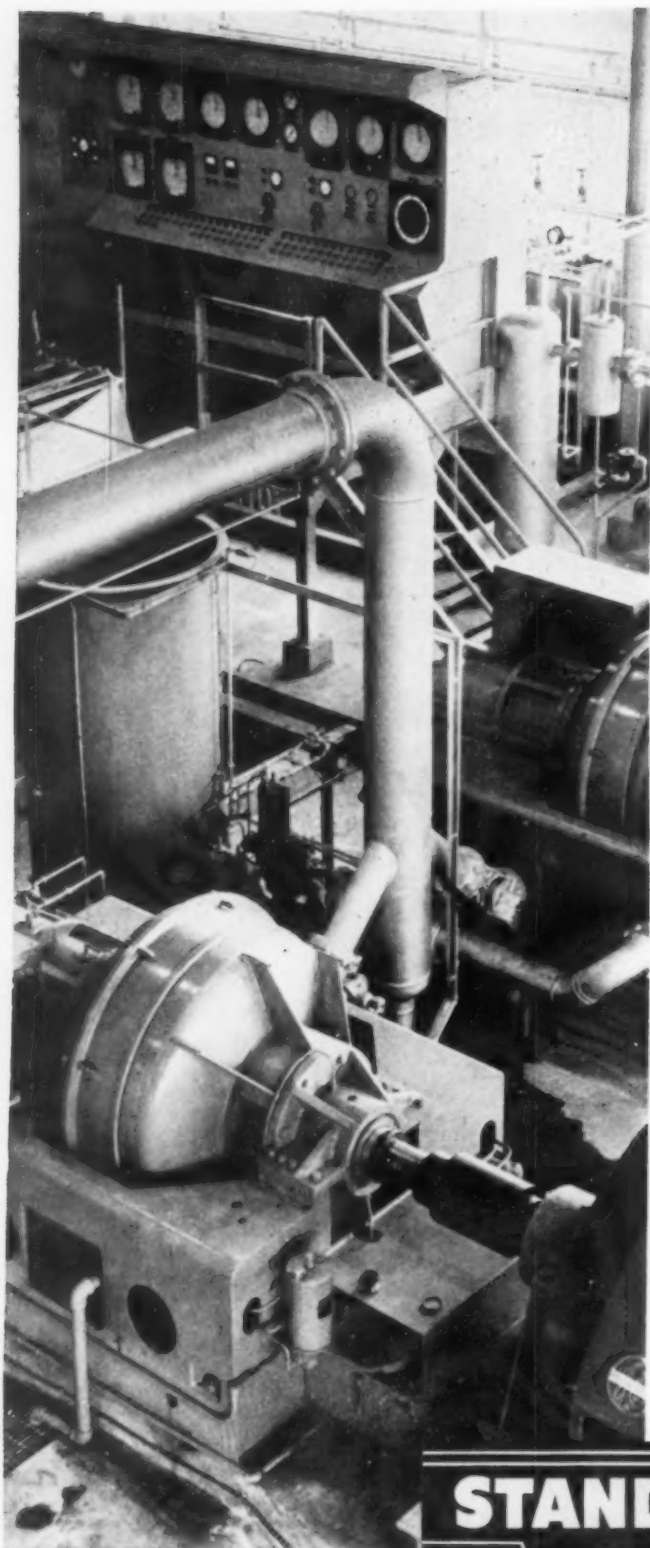
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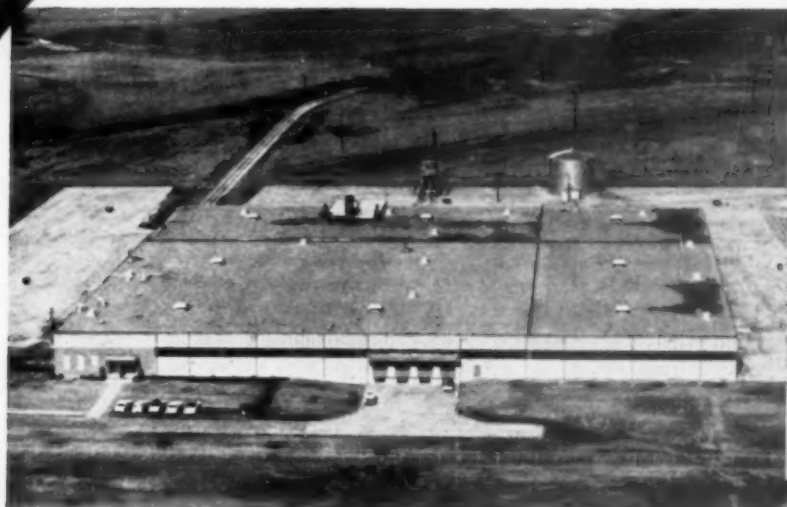
In serving Southern industry with dependable lubricants for seventy-four years, our lubrication engineers have acquired experience that can be valuable to you. This experience is backed up by the combined facilities for testing and research behind Standard Oil lubricants that are unequalled.

Whatever your requirement may be — there's a Standard Oil lubricant designed to do your particular job with economy, dependability and efficiency.

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# TIMELY COMMENTS ....

## Plant Engineering Must Help Management Keep Competitive and Profitable

**HIGH-VOLUME** industrial production, keen competition, and problems of rising operating costs in almost all phases of business make it absolutely necessary to focus full attention upon efficiency improvement and the resultant gain in profitability.

General Electric's Appliance Park recently celebrated its 10th anniversary. On July 7, 1951, construction started for what is now an *industrial community*, the home of the major appliance division, working over 10,000 employees and utilizing in excess of five million square feet of building area.

We attempt here to point out the role our plant engineering group has performed. The following opinions and statements are based on our philosophy, objectives, and work pattern while acting as a service component in this large decentralized organization.

As we review our status, we point out some of the items which should enable any plant engineering group to play a more important part in measurable contribution to company success.

Some of the contributing factors to satisfactory performance in our case are as follows:

- ◆ Perform, as near as possible, as a *competitive architectural and engineering service*, treating all of the operational components as *customers* with full recognition of their goals and objectives, being fully aware of the strengths and weaknesses of available talent. Keep alert to those outside engineering sources which can be called in to assist under peak load conditions.
- ◆ To the degree possible, *sell* the plant engineering services on a per-hour or unit-price basis. This arrangement provides an excellent measure of the engineering performance and offers the best opportunity to motivate freedom of expression. All work is thus accomplished on the basis of recommendations, rather than a directive pattern.
- ◆ Use the *balance sheet* approach in presenting all projects to management. Clearly state exactly what the benefits will be if the plan is carried through

and, on the other hand, be sure to define what results must be expected if the project is deferred.

Obviously, to properly work the factors mentioned above, it is absolutely necessary that plant engineering personnel devote keen attention to the functional and flexibility features of all projects. Good design criteria are necessary because modern industry cannot justify *monuments*, insofar as needed facilities are concerned. Proper balance of facilities to purpose must be maintained.

The plant facilities are *tools*, along with the employees who perform work — to the same degree or even more so than the actual specialized production line machines. Keeping employees happy on the job and providing functional facilities can well be the key to the much needed productivity increase. This theme must be kept in mind from the time an employee enters the outer gate until he leaves it after a full day. Parking facilities, building entrance and exit, industrial hygiene, safety, lighting, heating, ventilating, etc., are all parts of the package which is so important in achieving optimum performance.

We often use the term *practical facilities engineering*. This means having goals and objectives for facilities design which parallel those of the whole management team. Using fire protection facilities as an example, it would be a determination of how well protected the industrial plant can afford to be. A well designed program within the bounds of the economic considerations, can be wholly effective only as long as it is in keeping with the type of business and is carefully communicated to all who are involved. In one plant, the bare fundamental facilities will be most adequate, while in another a most elaborate fire protection system is fully justifiable.

Alertness to innovation and a never-ceasing effort to improve the efficiency and performance by application of knowledge and experience would be other examples of important contributions.

Plant engineering must be the liaison function between operating components and construction people



By **JOHN VONDERHEIDE**, Manager Plant Engineering, General Electric Co., Appliance Park, Ky.

**EDITORS' NOTE:** Normally SPI's staff prepares an introduction (under the heading **Timely Comments**) to lead-off each Annual Better Production Issue. But this time one of our readers has done a more effective job than we can. So the editors are pleased to yield this special space to Mr. Vonderheide.

when new facilities are being considered. It has been found that this service alone is a heavy contributor to cost reduction because the most factual design criteria can be interpreted and built into the project from the start. The pattern and long-range needs should be clearly understood by the facilities engineering people, and this knowledge should be used to prevent waste from being brought about by short-term situations. As an everyday task, this liaison function works between broad management and the operating components in setting reasonable renovation schedules and providing continuity of adequate plant services.

A closer look at the everyday task of achieving improvement from necessary service facilities reveals that plant engineering has a terrific responsibility and opportunity. Steam, power, water, gas, sewers, etc., were all put into the plant with a unit price objective in mind. In other words, these facilities have a built-in capacity for good efficiency, but it is often difficult to achieve the full savings impact.

Careful scheduling of operations, fuel, maintenance work, etc., all represent cost improvement potential factors and it should be the job of every facilities engineer to know the kind of performance being experienced. Keeping production and operation people informed as to the seriousness of waste and the bene-

fits of proper application can lead to important money savings.

It is very easy to become complacent and assume the attitude that the plant services are working well — missing the chance for further improvement by reason of technological developments or updated changes which make further efficiency possible. This mention of typical services is representative of what can happen throughout the whole facilities area, and any laxity on the part of plant engineering will automatically ricochet throughout the plant.

Perhaps the above expression of our experience while working under the concept of decentralization may seem to be too much of a departure from the dictatorial or very strong centralized plant engineering function of some years back. Those were years when all responsibility for general plant type facilities rested directly in the hands of the plant engineer, but we believe that any industrial operation could consider the use of our service type approach with good results.

We work to keep our own plant engineering service attractive in comparison with all other sources for accomplishing the work. This alone puts us in position to be respected as a contributor to profitability, with full awareness of competitive situations throughout the business.

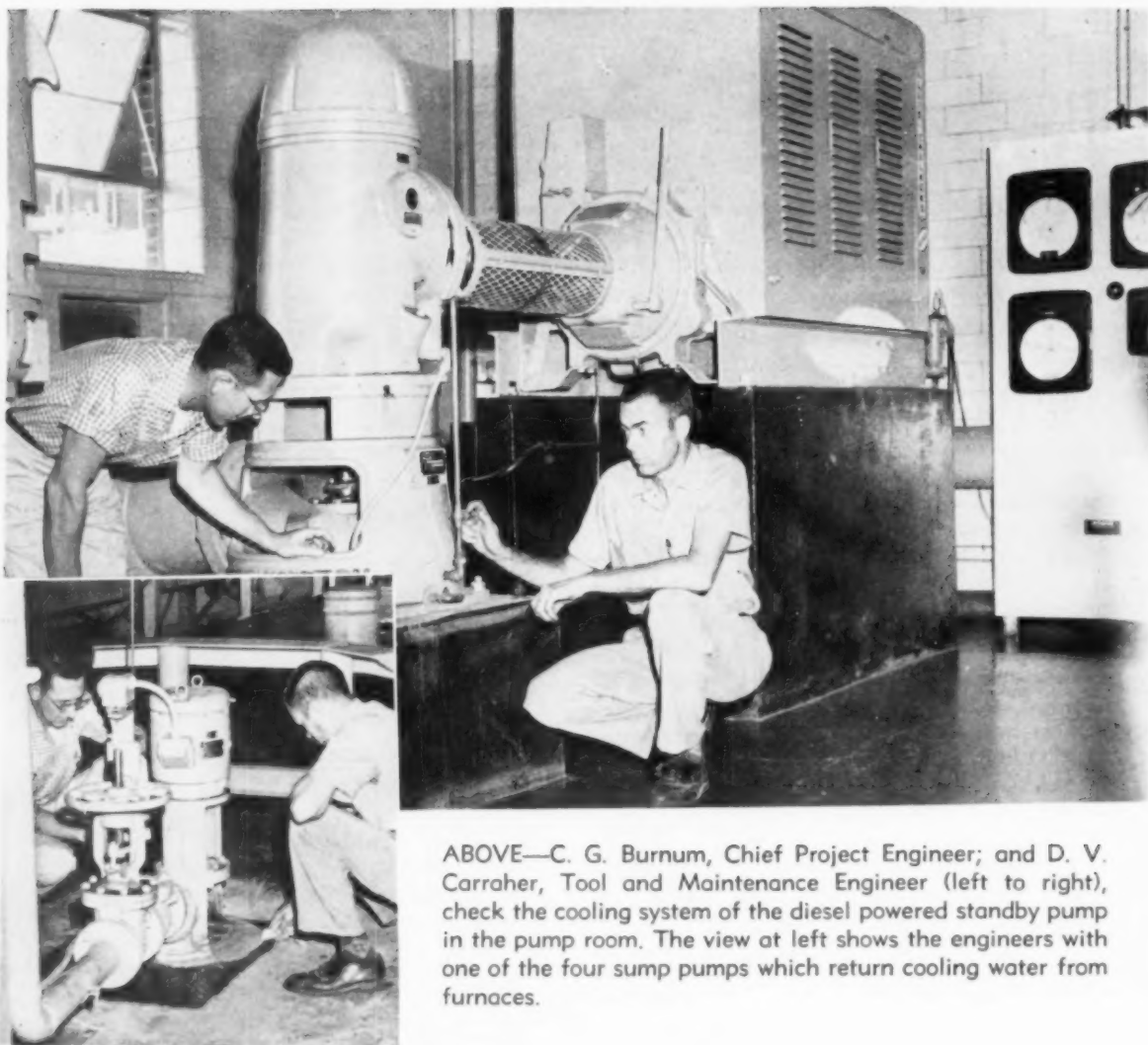
## FREE READER SERVICE

A full-size reader service card is provided for your convenience on page 85. USE IT to request more information on any of the Case Studies on the following pages.

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ABOVE—C. G. Burnum, Chief Project Engineer; and D. V. Carraher, Tool and Maintenance Engineer (left to right), check the cooling system of the diesel powered standby pump in the pump room. The view at left shows the engineers with one of the four sump pumps which return cooling water from furnaces.

### Case 1 — Alabama Metal Tubing Plant

## Recirculation System Cuts Water Cost 60%

**IN THE OPERATION** of a mill for the production of nonferrous tubing, an abundant supply of water is necessary. At the Decatur, Alabama plant of Wolverine Tube, Division of Calumet & Hecla, Inc., the cooling of pouring molds in the casting operation, conveyor rolls and bearings in annealing furnaces, quenching hot extrusions and annealed tubing, air compressors, after coolers, many heat exchangers plus domestic and sanitary

**By R. A. Allen**

**Plant Engineer  
Wolverine Tube  
Division of Calumet & Hecla, Inc.  
Decatur, Alabama**

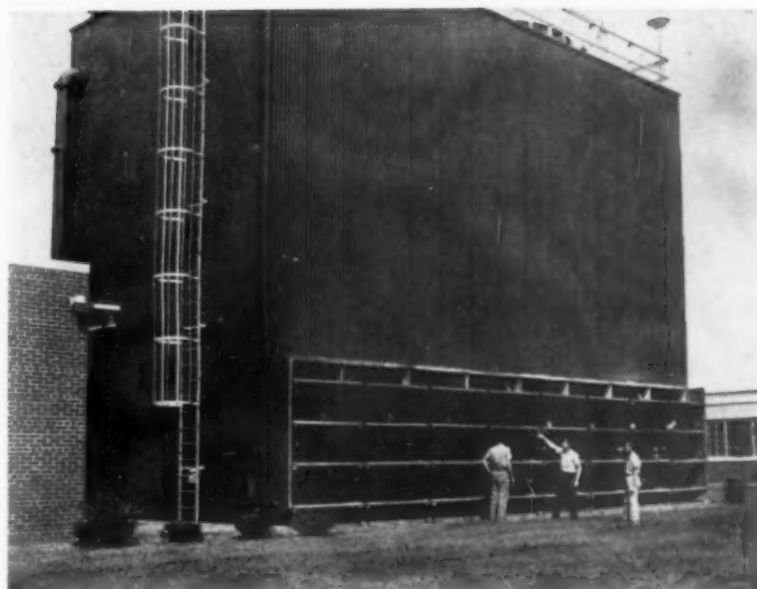
usage requires quantities of water exceeding 2,000 gpm.

This plant, located on the banks of the Tennessee River, obtains its full requirements of water from the municipal system of the City of

Decatur. Several years after the beginning of operations in late 1948, usage approached the point beyond which water could not be continuously supplied from the domestic source at pressures adequate to continue efficient operation of some equipment.

Booster pumps were installed in water mains at various locations in the plant to provide sufficient pressure at critical locations and test holes were sunk in an unsuccessful

External view of the cooling tower of the process water recirculation system with a portion of the pump building appearing at the left. R. A. Allen, Plant Engineer, is pointing out the louver hangers.



attempt to locate a suitable supply of ground water. As requirements continued to increase, it became obvious that more effective measures were required.

In 1958 preliminary studies of the plant water supply problem indicated that the domestic source was satisfactorily maintaining the pressure of that system and that the pressure drop actually occurred in the 10" process main which supplied water from the source to the mill. This line, steel through most of its length, apparently had corroded and tuberculated during the ten years of use, and this plus the fact that actual usage had risen to almost seven times what the system was designed to handle, resulted in pressures inadequate to supply sufficient water to the various pieces of using equipment.

### Thorough Study Made

An outside engineering firm was contracted to conduct a thorough study of the water consumption problem at the Decatur Plant and make recommendations for improvements to alleviate the unsatisfactory condition. Four avenues were considered; namely, the installation of an additional main paralleling the one in use, construction of a partial treatment plant to supply process water from the Tennessee River, the construction of a complete treatment plant to supply full water requirements, and finally the construction of a recirculating and cooling system for process water.

The first alternative, that of duplicating the existing service, although presenting the least first cost, was eliminated since its sole justification was its ability to furnish more water at an obviously high total water cost. The consul-

ants then prepared from their detailed studies preliminary plans and estimates on the three remaining alternatives and these were presented to the proper management personnel for consideration.

At the conclusion of much discussion, it was determined that the most logical and economical solution to the problem would be the construction and installation of a recirculating and cooling system for process water.

### Recirculating System

Upon obtaining approval to proceed with this plan, the consultants prepared detailed drawings, designing the system to answer the specific need of the plant but sized to allow for contemplated expansion of plant facilities. A 3,000 gpm system was designed with provision for alternating dual recirculating pumps and an auxiliary diesel powered pump which cut in automatically in the event of electrical power failure.

Automatic water level controls operate the hot well pumps which lift the heated water to the top of the cooling tower. Make-up to replace that lost by drift, evaporation and dragout was provided from the domestic source. A two cell counterflow redwood cooling tower was selected, with corrugated cement asbestos sheets applied vertically to the shell to

match the siding on the existing plant building.

Much of the cooling water delivered by this facility is returned solely by gravity. However, it was necessary to install sump pumps in four locations throughout the plant. These pumps lift the water to a gravity return line in the truss area of the mill building for its return to the system hot well.

Excavation for the construction of the facility was begun on January 5, 1960. Installation of overhead piping, connecting piping and construction of sumps were accomplished during operating hours whenever possible but never at the expense of production operations. The system was tied in to all using equipment during the holiday period of May 30, 1960 and was put into use with no loss of production.

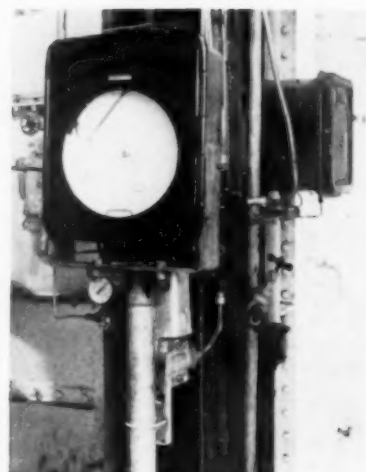
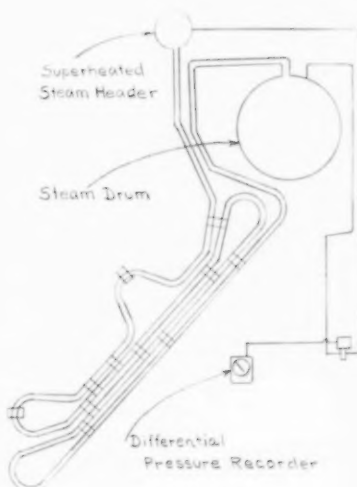
### Water Cost Reduced

Prior to the installation of this facility, water consumption at the Decatur Plant reached approximately 16,000,000 gallons per week. Consumption at the present averages approximately 6,000,000 gallons per week. This installation has reduced water costs approximately 60%. This is an example of how an industry found a satisfactory solution to a difficult problem and at the same time reduced plant operating costs.

## Intercepting Boiler Superheater Tube Failures

Fig. 1 (left)—Differential recorder connections.

Fig. 2 (right)—The transmitter and recorder.



**SUPERHEATER** tube failure has been a major factor in plant boiler outage records over a long period of time. By use of a differential pressure cell transmitter it is possible to determine when the unit should be removed from service for cleanup before a rupture occurs.

Water used in making steam at the Island Power House of the Union Carbide Chemicals Company's South Charleston, West Virginia Plant is taken from the Kanawha River, which flows westward by the plant to join the Ohio.

Steam is produced at 600 psig, passed through turbines to produce electric power, and exhausted at 195 psig for use in chemical processing. Because of the nature of the processes involved, condensate recovery is limited normally to less than four per cent of the amount of boiler water requirement.

The river water compares favorably with most water used for making steam. However, the fact that over ninety-six per cent of the boiler water must be pumped from this source has contributed to the problem of steam scrubbing throughout the twenty-six-year history of the Island Plant.

Boiler water treatment starts with pH adjustment followed by coagulation with alum. From the mixing basin, it flows into an ac-

celerator where most of the sediment is removed. Final clarification is attained by using sand or anthracite coal as a filter medium. This is followed by softening with Permutit "Q" resin in pressure vessels. After softening, approximately five ppm of a phosphate antifoam mixture is added. Further treatment is made by the addition of sodium sulphite and sodium hydroxide as required for the individual boilers.

The water treating department does a commendable job; but with ninety-six per cent make-up water, the solids concentration of the water in the boilers varies widely, influenced principally by river conditions as they change with the seasons.

The performance of the steam purifiers of the plant boilers is within the manufacturer's specifications according to extensive steam purity tests which have been conducted. However, there was reason to believe that the boilers were producing steam of much lower purity than that

shown by the purity tests. This was indicated by frequent superheater tube failures, deposits accumulated at the entrance to the superheater tubes as shown by visual inspection during boiler outages, and fouling of turbine blading. Consequently, another technique had to be developed to show that these conditions were the result of low steam purity.

The larger percentage of failures of boiler superheater tubes is due to solids carried by the steam and deposited inside the tubes. In time, this deposit increases until the flow of steam is restricted. This allows the metal of the tube to become extremely hot and eventually to rupture.

The failure of a superheater tube necessitates the removal of the boiler from service and repair of the damaged tube. This type of outage, which is almost always unexpected and usually requires rapid operational changes to compensate for the lost steam production, is to be avoided if possible.

By **W. A. Booher**

Assistant Department Head  
Union Carbide Chemicals Co.  
South Charleston, W. Va.



Avoiding unexpected interruptions because of superheater tube failure requires some planning and expenditure, but experience has shown that it pays.

With the above in mind, it was decided to measure pressure drop across the superheater tubes, but realizing fully that increased pressure drops would not be a dependable indication if the deposits were restricting only a few of the tubes.

Rather than use the difference between two gauges, a decision was made to use a pressure differential transmitter with a recording chart. This was to be done as a test, but it has proved to be a very valuable instrument for scheduling boiler outages prior to tube failures. In addition, it has verified the fact that the boiler is producing steam of much lower purity than has been indicated by our present steam sampling procedure.

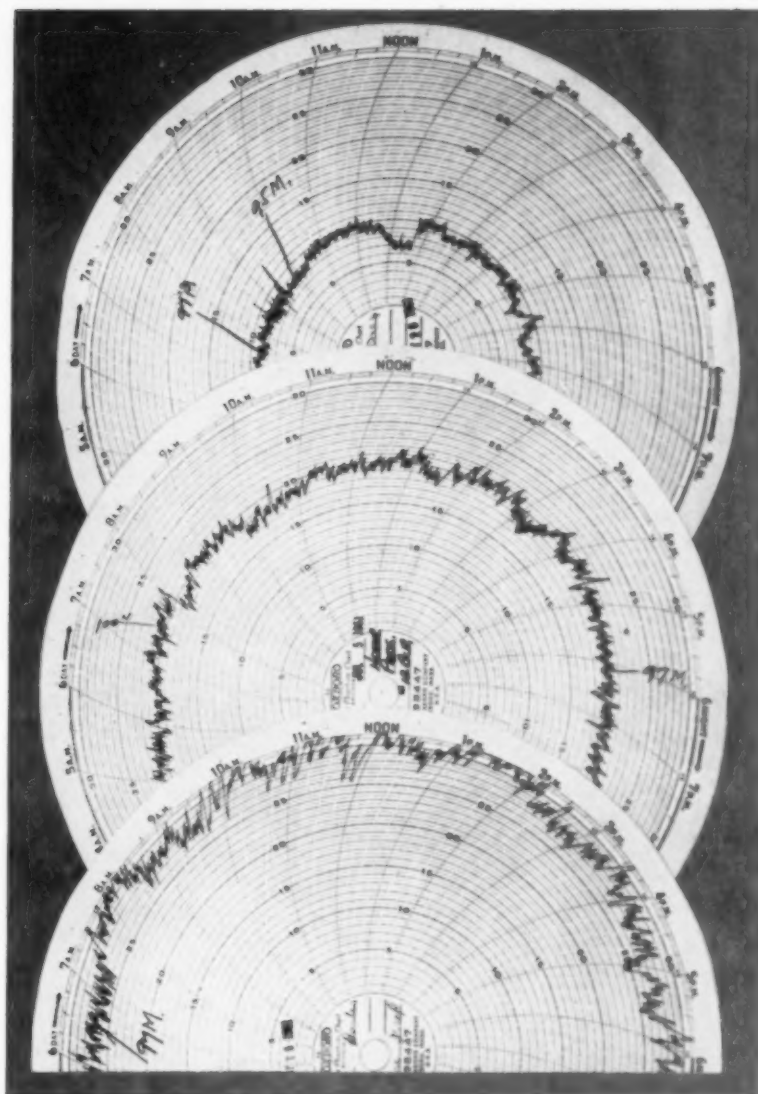
Figs. 1 & 2 show the differential pressure instrument employed. This instrument has a range of 0-30 psi. The high pressure lead is connected to the superheater inlet and the low pressure lead to the superheated steam header. Thus, the differential across the superheated steam tubes is transmitted to the pressure recorder.

This method, as applied at the Island Power House, is illustrated by the accompanying differential pressure charts from boiler Number Twelve, a one hundred M pounds per hour unit. The superheater section of this unit consists of twenty-one elements, each made of two-inch O.D. number eight gage seamless steel, approximately ninety-two feet long. This unit is normally operated near its rated capacity twenty-four hours a day.

In Fig. 3, the boiler has been returned to service after an outage, during which the superheater tubes were cleaned by alternately filling them with water and purging with air pressure. With the superheater tubes clean, the differential pressure across the tubes at one hundred M pounds per hour boiler rating is recorded at 9.5 psi.

Fig. 4 illustrates the increase in pressure differential after a month and a half of operation. The differential pressure at normal boiler rating has reached 20.5 psi.

In Fig. 5, the chart indicates



Differential charts are normally examined with matched steam-flow charts. But since the steam flow was essentially the same, the flow charts are omitted in this illustration.

Fig. 3 (Upper)—Differential pressure right after superheater was cleaned.

Fig. 4 (Center)—Shows increase in differential after six weeks operation.

Fig. 5 (Lower)—Differential has reached 29.5 psi, so it is time to clean tubes if failure is to be prevented.

that at normal boiler rating the differential across the superheater tubes has reached 29.5 psi, which is an increase of 20 psi. Experience has shown that trouble at this point is imminent. Either a planned out-

age is scheduled at this time, or an unscheduled shutdown will result.

This instrument installation has proved to be very reliable and trouble free. Its sensitivity is well within the required limits.

## Nuclear Gauge for Automatic Density Control

L. O. Harrell, instrument supervisor at the Mead Corporation's Kingsport Division, checks the installation. At left is tank for mixing water and white clay. At the enlarged section of pipe, between mixer and storage tank, an Ohmart gauge checks density of water and clay slurry.

By **L. O. Harrell**

Instrument Supervisor  
The Mead Corporation  
Kingsport, Tennessee

**AUTOMATIC CONTROL** for mixing clay and water used as a filler in the making of coated and uncoated papers is achieved through a closed loop system involving air, electronic, and nuclear controls.

The system controls rate of production, proportioning, and provides the necessary shut-off procedures in the event one or more phases are not in line with the remainder.

The present system replaces a previous manual batch method. In the old system, one full time employee was responsible for unloading clay, using a shovel type truck, mixing, and checking proper ratios. With the new system, wastage is cut and ratios are maintained without constant attention. Production supply is constant compared with previous estimating of needed batches during one day.

The new system paid for itself in approximately one and one-half years. Operation is seven days per week, 24 hours per day. Approximately 30,000 pounds of clay are mixed per day and fed to four large paper making machines also in constant operation. Shut down

is twice a year for necessary checking and cleaning.

Essentially, the system controls the amount of clay propelled into a mixing tank, amount of water poured into the same tank, and gauges when more or less production is required by signal action from the storage tank where the mixture is held before feeding to the paper making machines.

### Control

Control begins when level in the 5,000 gallon storage tank drops below normal. A 3-15 psi air signal is transmitted to an air operated rheostat and, at the same time, to a ratio meter. The rheostat controls a variable speed motor operating a screw conveyor to move white clay from storage bin to mixing tank. With a preset ratio, the ratio meter positions the water valve with the air signal in combination with a flow signal transmitted from an orifice in the water line through

a square root converter.

As water and clay converge into the 440 gallon mixing tank, a 10 to 50 minute control cycle begins, depending on the production rate. As the slurry is mixed in the tank by a propeller type mixer, the surplus water-clay slurry is pumped into the storage tank.

### Automatic Check

Immediately after leaving the mixing tank, the slurry is automatically checked for density by an Ohmart gauge. At an enlarged section of the pipe, a radioactive source is clamped to one side and an Ohmart gamma radiation measuring cell to the other. This latter converts radioactivity to a minute electrical current. This is amplified and transmitted through a density recorder to the ratio meter.

This amplified signal enters the ratio meter which then either slows or speeds the amount of clay





Amplifier (left) increases electrical current to required power for actuating recorder-controllers. The six foot high panel at right holds the recording and controlling mechanisms.

entering the mixing tank and does a similar job on amount of water required. Radioactivity transmitted and electrical current vary as a function of the slurry's density.

#### Accuracy

Control is extremely accurate since the gauge operates on  $\pm 0.2\%$  variations in specific densities of

materials. Because water and clay are two dissimilar materials with greatly different specific gravities, changes in the mixture ratio are easily sensed by the Ohmart gauge. Control is maintained despite any variations in slurry production rate.

Additional control measures (including a bubble pipe level control

and transfer pump throttle and recirculating valves) provide automatic stop and start of process.

This system normally provides 8.33 gallons of 1.171 specific gravity slurry per minute accurately to  $\pm 2\%$  of specific gravity. The system controls specific gravity to  $\pm 1\%$  about 95% of the time and to  $\pm \frac{1}{4}\%$  about 67% of the time.

### Case 4 — Southern Paper Mill

## Static Excitation for Paper Mill Generator

**A LARGE SOUTHERN** paper mill has installed a static type of excitation system on a 25,600 kva turbine driven generator, in order to eliminate possibility of difficulties which have been experienced in the past in paper mills, on account of rotating commutators of direct-connected or motor generator excitation sets.

The static excitation system utilizes

silicon rectifiers to obtain field current for the a-c generator by rectifying a-c generator potential and also rectifying the secondary load current from current transformers. Therefore, the load currents are used to "compound" the a-c generator in a similar manner to the compound wound d-c generators.

The static excitation and regu-

lating systems eliminate all contacts and moving parts prevalent in previous excitation and regulating systems.

As the result of the good experience during operation in this mill by using the static excitation system, several other mills are now being provided with this type of excitation system for turbine-generators, even larger than installed in this mill.

*By H. B. GREEAR, Senior Application Engineer for the Southeastern Regional Industrial Sales Operation of General Electric*



Fig. 1—New plant of Hanes Hosiery Mill, Winston-Salem, N. C.

## Overhead Handling

### Case 5 — North Carolina Hosiery Mill

**THE NEW HANES** Hosiery plant was completed in July of 1960. It is located near Winston-Salem, North Carolina, and is capable of producing 50,000,000 dozen seamless women's hose a year. The plant has 721,325 square feet of floor space and some 22 acres of parking space. The complete facilities are located on a one square mile track. The cost of the plant, minus production equipment, was \$8,000,000.

At the present, the new plant is operating at only a fraction of its production potential, but will be in full production by 1964. In addition to the modern conveyor system pictured on the opposite page, the latest in knitting machinery has been installed.

The Webb 3" automatic dispatching Power and Free Conveyor is 6,790 feet long and transports hosiery in 24-dozen lots through six departments. It saved 45,000 square feet of floor space over the conventional method of using 3' x 3' carts holding 60 dozen, plus the labor of pushing these carts to and from each department, and reduced in-process inventory, because 24-dozen lots take less time to process and consequently move faster.

The transportation and storage portion of the conveyor is located

overhead. In the knitting department the track is lowered to a working height around the perimeter of the banks of knitting machines, which permits the operators to conveniently load and unload. The track is well above head height but the container is only 3 feet 9 inches above the floor. This is not a hazard to personnel since the containers are spaced 10 feet apart and travel at 15 feet per minute. This allows ample time to walk through a space equal to their 10-inch width.

In other departments, except grey storage, lift sections are pro-

vided to lower the containers to working height for loading and unloading. In the grey storage department the conveyor is unloaded from a mezzanine.

The goods are transported in an aluminum frame container, covered with fabric to enclose and protect the goods while they are on the conveyor. The cycle of operation begins in the knitting department and then follows in sequence to the looping department, the inspection department, the make-up department, the pre-boarding department, and ends in grey storage.

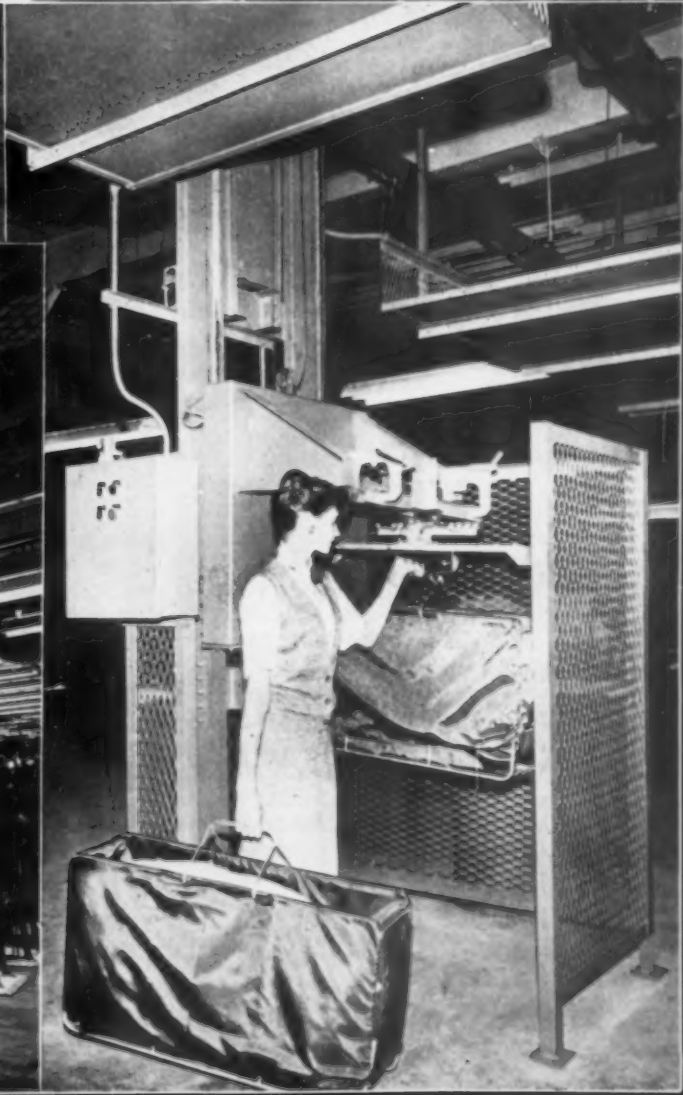
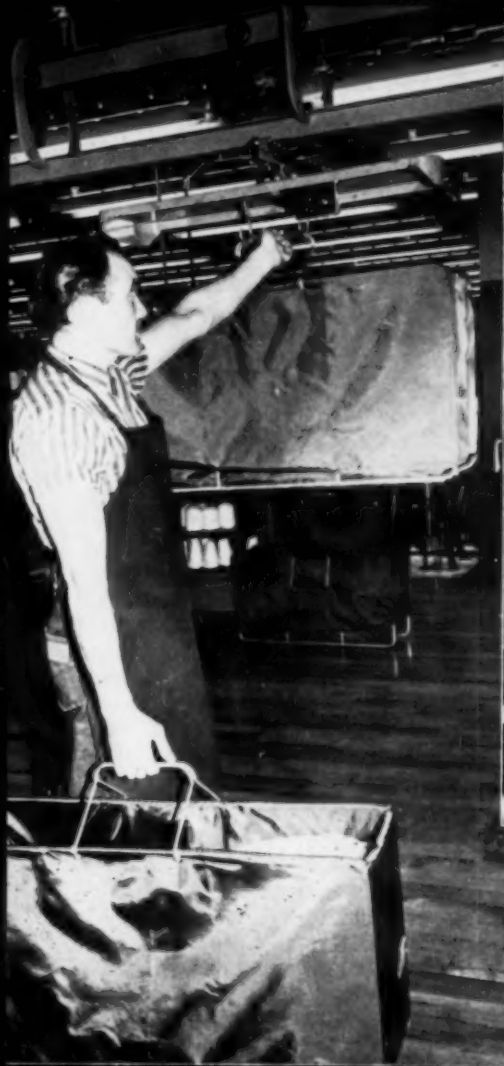
Fig. 2—A knitter removes empty hose container from the conveyor, which will be replaced by a full one.

Fig. 3—The conveyor ends on a storage mezzanine where the goods are stored in assigned bins.

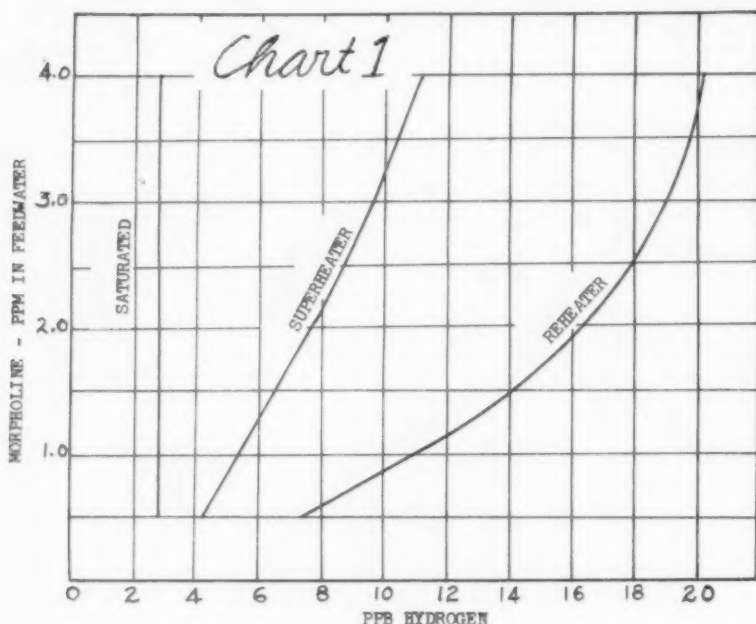
Fig. 4—Use of overhead area for movement of the hose containers saves storage space and facilitates production. From knitting, containers are dispatched automatically to pre-selected looping stations.

Fig. 5—A drop section allows the power and free carrier to be lowered for easy loading and unloading.





## Report on the production of hydrogen in a high pressure boiler which contains morpholine and hydrazine in varying amounts in the feedwater.



# Morpholine Decomposition

By S. L. TERRY, Senior Chemical Engineer  
and T. M. BROACH, Operating Chemist  
Southwestern Public Service Company

**DURING STUDIES** of boiler and pre-boiler corrosion processes, we have collected data which leads us to conclude that under conditions considered to be normal, both morpholine and hydrazine decompose in boiler superheating and reheating sections and release hydrogen which may then interfere with the interpretation of hydrogen analysis performed on the steam.

Limited observations indicate that such decomposition is a function of the concentration of the material (morpholine or hydrazine) and the temperature of the metal surfaces contacted. There is an indication that other variables may affect the rate of decomposition. Several have been investigated.

We have recently been engaged in a study to relate the amount of hydrogen in the steam leaving a boiler to various conditions which prevail inside the components of that boiler. We have felt for some time that the hydrogen content of saturated steam might correlate with (1) the amount, and state of oxidation, of iron entering the boiler, (2) the attack of boiler metal by caustic concentration cells and "gouging," and/or (3) the presence of hot spots. Such reasoning was not, of course, original, since much work has been done along such lines in other parts of the country.

In the course of this study, it became necessary to consider the various other sources of small amounts

of hydrogen so that results of experimentation could be accurately interpreted. The use of the hydrogen analyzer-recorder to predict the oxidation of superheater and reheater tubes due to the steam-iron reaction in 1000 F boilers also made it necessary to search out and understand the possible sources of hydrogen other than that produced from the water molecule.

The collection of a set of data such as is needed to understand the processes discussed here is accompanied with several problems because of the necessity of obtaining the data in an operating plant under controlled conditions. Other problems due to the small quantities of hydrogen, parts per billion, and the poor accuracy of the morpholine determination are also present.

As a result of these problems, the curves were drawn through points which are averages of several readings at each condition. Under test conditions, we feel that a Cambridge hydrogen analyzer-recorder is accurate to plus or minus one ppb hydrogen. The method for morpholine determination used for this study is accurate to plus or minus one-fourth ppm.

Such accuracy is probably acceptable, since one part per billion hydrogen for one year in this unit indicates that only 84 pounds of iron have been oxidized if the hydrogen is produced completely by the iron-steam reaction resulting in magnetite.

The studies were made on an 800,000 pound per hour Combustion Engineering boiler producing steam at 1450 psig, 1000 F, 1000 F. The hydrogen data was taken from a Cambridge hydrogen analyzer.

The first study which was made produced the three curves on Chart 1. The boiler brine conditions were as follows: 10.5 pH, phosphate 40 ppm (as  $\text{PO}_4$ ), hydrazine feed (at feed pump suction) 15 ppb and controlled. The load on the boiler was 650,000 pounds per hour. Steam temperatures were 1000 F, 1000 F.

Dissolved oxygen in the boiler feedwater was 3.0 ppb and constant.

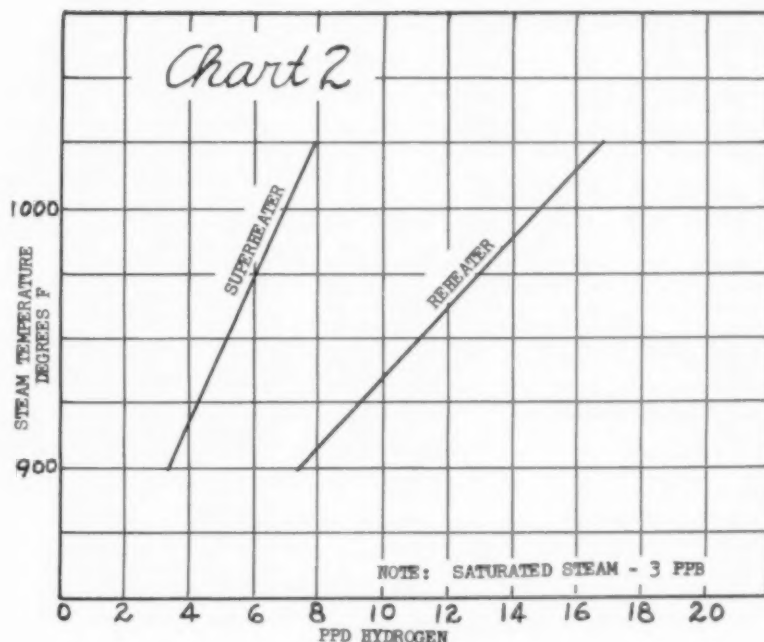
The three curves indicate that the rate of hydrogen produced in the superheater increases from about 5 ppb at 0.5 ppm morpholine in the feedwater (pH 8.4) to 10.5 ppb at 3 ppm morpholine in the feedwater (pH 9.2). In the reheater, the ppb hydrogen over the same range of morpholine concentrations (0.5 to 3 ppm) is 7 to 20 ppb. In this boiler, the spray atomizers are off at this load and the gas burners are tilted from 4 to 10 degrees up.

The variation in the amount of hydrogen produced in the superheater and reheater is of interest. Chart 1 indicates that more hydrogen is produced in the reheater than in the superheater at a given morpholine concentration.

Data will be presented below to show that with other conditions constant a steam temperature change in the reheater or superheater is accompanied by a change in hydrogen produced. These data allow us to theorize that the metal temperatures in the reheater are higher than the metal temperatures in the superheater and hence the production of hydrogen is higher.

Several other variables have been considered in an effort to explain this difference. The catalytic effect of the TP-321 alloy in the last loops of the reheater elements was thought to be a likely cause in the first boiler which showed this pattern since the superheater was T11 and T22. The boiler which produced the data in Chart 1 has TP-321 alloy in the hot end of both the superheater and reheater. This makes the catalyst theory appear less likely, although still a possibility.

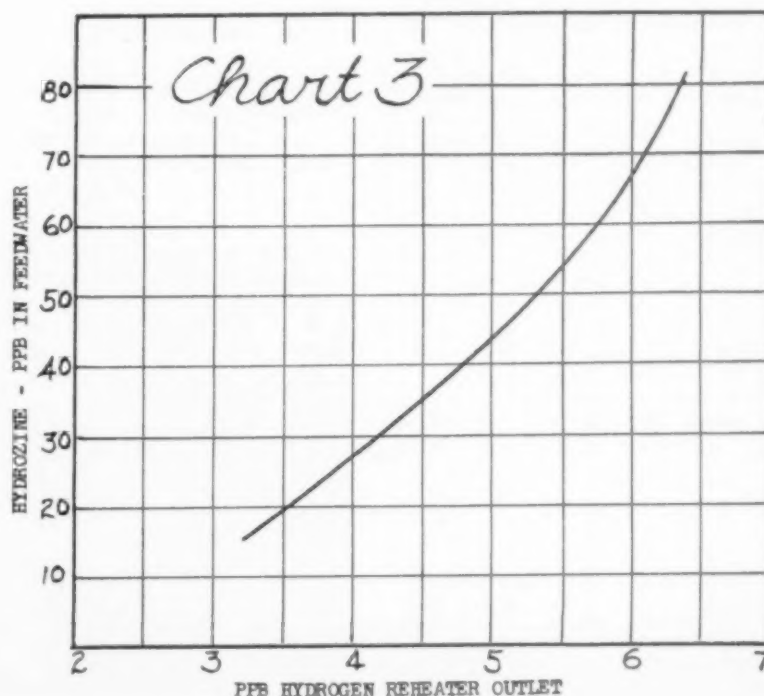
Some operators have noticed evidence that morpholine decomposes to ammonia more readily in the presence of oxygen than in its absence. Chart 1 data was collected with continuous hydrazine feed in excess of that theoretically required to react with the oxygen recorded in the feedwater. Such conditions indicate that oxygen is not a factor in the decomposition of morpholine to produce hydrogen. Morpholine decomposes very rapidly



in this boiler. At 650,000 pounds per hour, 1450 psig, 1000 F, 1000 F, a 3 ppm morpholine reading falls to 1 ppm in approximately 3 hours.

The possibility of producing ammonia from morpholine and then disassociating ammonia in the superheater and reheater to produce hydrogen was investigated. At the

same general conditions of the above tests, two pounds of 30% ammonium hydroxide were introduced into the boiler. The condensate pH went immediately from 9.2 to 9.5, the conductivity of the saturated steam went off scale on a 10 micromho chart, but the hydrogen in the reheat out sample



held at a continuous 9 ppb reading. Morpholine was being maintained at .7 ppm.

The relation between superheater and reheater metal temperature and morpholine breakdown was studied. Since metal temperatures in these sections of the boiler are not subject to exact nor continuous measurement, the hydrogen data gathered was plotted against the steam temperature. This establishes trends which we represented as straight lines. This may or may not be characteristic of the relationship since the steam generation was 650,000 pounds per hour and this required a spray in the superheater when operating at the 950 F points. The data taken at 1000 F points were taken with spray attemperators off.

The curves in Chart 2 illustrate the hydrogen increase with temperature rise. The conditions in the cycle were as follows: Boiler brine pH was 10.5 and phosphate 40 ppm (as  $PO_4$ ). Hydrazine feed was 15 ppb and controlled, with morpholine maintained at 2 ppm in the boiler feedwater.

While not of prime importance, it is of interest to again notice from Chart 2, that the increase in hydrogen through the reheater is higher at each steam temperature than the increase in hydrogen through the superheater. The superheater with sprays in service shows less hydrogen produced than the reheaters which are not sprayed. The same variation holds true at 1000 F with the sprays off.

Hydrogen produced from morpholine breakdown is not affected by the presence of hydrazine under the above test conditions. The curves on Chart 1 and Chart 2 have been reproduced in the absence of hydrazine and nothing was observed which would indicate that morpholine breakdown is associated with the presence of hydrazine.

When hydrazine is fed in excess of the amount which reacts with oxygen or the higher oxides of iron, the excess decomposes in the boiler drum to ammonia and nitrogen or distills over as hydrazine. Analysis of the steam from the boiler used in the above tests shows that hydrazine will decompose in the superheater and reheater to produce hydrogen in an

amount which correlates with the excess hydrazine fed to the boiler.

The data used on Chart 3 was taken under the following conditions: 650,000 pounds per hour steam flow, 1000 F, 1000 F, boiler brine pH 10.4, phosphate 40 ppm, and zero morpholine. Oxygen in the feedwater was 3 ppb and the hydrogen in the saturated steam was 3 ppb. Hydrogen was observed

only on the reheater outlet steam sample. It will be noted that hydrogen from this source is negligible (1.0 to 2.0 ppb) when reasonable excess of hydrazine is fed. Hydrogen from this source could, however, confuse studies involving the iron-steam reaction if hydrazine feed and /or dissolved oxygen were erratic in the cycle being studied.

### Case 7 — Tennessee Foundry

## Furnace for Special Alloy Steels

**ROSS - MEEHAN** Foundries at Chattanooga now is capable of quickly fulfilling its customers' small order requirements for special alloy steels as a result of installing a 300 - pound induction furnace.

In the past years, a 1½ ton electric arc furnace was the foundry's smallest melting unit. The total casting weight of a particular grade of steel had to be at least 1,000 pounds before production of that steel could be put underway.

According to James L. Payne, vice-president in charge of sales, on some occasions deliveries on lightweight castings of special alloys, of necessity, were delayed because of the time required to accumulate sufficient tonnage for a heat. The foundry is no longer handicapped with this problem. The induction melting furnace has closed a gap in the 50 pounds to 200 pounds casting weight range of special steels including stainless

grades, Mr. Payne said.

The melting procedures and control records for the induction furnace were established through the assistance of David F. Bowers, foundry engineer at Ross-Meehan, Mr. Payne said. Mr. Bowers, granted a foundry education foundation scholarship in September, 1956, was graduated from the University of Alabama in June of 1959 with a B.S. degree in metallurgical engineering.

Induction melting employs the principle of inducing electric current into a steel scrap or alloy charge. As the current passes through the charge a terrific heat is developed, due to the resistance of the scrap. The heat causes subsequent melting, and as melting proceeds more current is applied to the scrap until the total charge becomes molten. The furnace has a power input of 100 kilowatts at 3000 cycles and a rated capacity of 300 pounds.





## Case 8 — South Carolina

No loss of production time, low maintenance cost, improved efficiency, and automatic operation are advantages of the new boiler enumerated by Julius Hertz, plant engineer, shown checking automatic features of the installation.

# New Boiler Saves \$14,200 a Year

**A NEW 600 HP Model CF Superior** boiler of the package type installed at Brookline Fabrics, Inc., Greenville, S. C., saves \$14,200.00 per year. The economies are effected by a \$10,000.00 reduction in maintenance and fuel cost, plus another \$4,200.00 per year reduction in labor costs because of automatic operation.

Advantages of the new boiler installation are:

(1) No more loss of production time due to boiler breakdowns, because the new boiler is much more reliable than those replaced.

(2) No maintenance cost has been incurred to date.

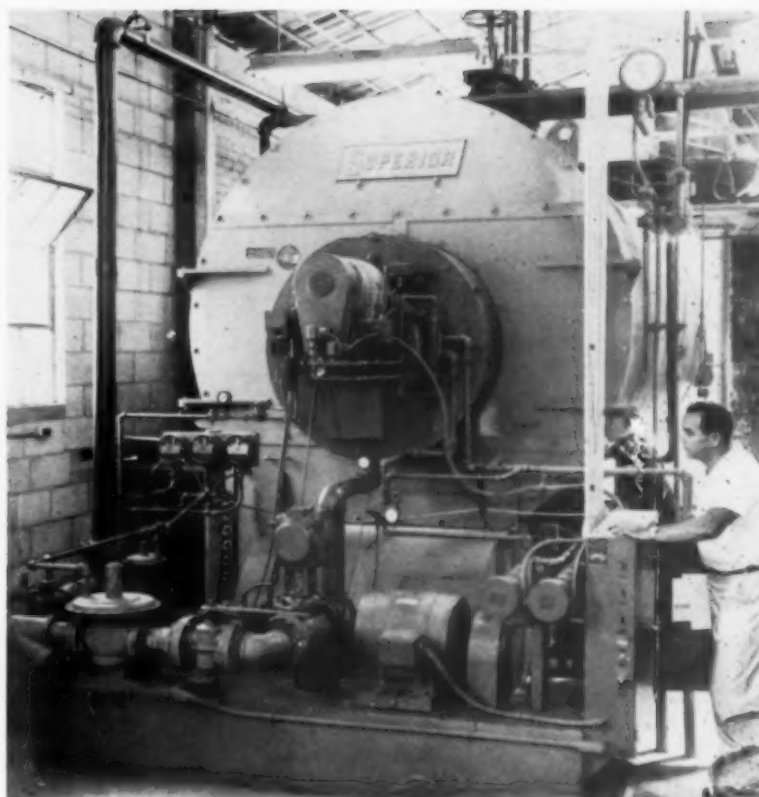
(3) Firing efficiency is kept at 82-85 per cent, as compared to 70-73 per cent on the old installation.

(4) Automatic operation saves labor.

The new packaged boiler replaced units totaling 585 boiler horsepower, including an inefficient and obsolete 85 hp oil fired unit. Now the entire mill is run on the new 600 hp boiler with two smaller boilers totaling 500 hp on standby and for possible future expansion of the plant. The boilers supply steam for heating the mill and for hot processing, including dyeing and drying.

Overtime repair labor costs for the last year of operation for the old boilers amounted to about \$1,500.00, not counting parts cost. There has been no maintenance cost on the new boiler since it was installed in February, 1961.

The new boiler burns natural gas with No. 5 fuel oil as standby.



The gas is purchased on an interruptable basis during winter months. A 10,000 gallon oil storage tank provides a reserve of fuel for standby operation.

Fuel consumption is 170 gallons of oil per hour at maximum firing rate, or 25,000 cubic feet of natural gas at maximum firing. The boiler operates at 100 pounds steam pressure and is rated at 150 pounds. Changeover from gas to oil firing requires only that an operator stop the boiler, flip a switch, and start it up again.

Fuel savings are calculated as follows: The old operation required five barrels of No. 5 oil per hour at \$3.03, or \$15.15 per hour at full firing rate. The new boiler uses 25,000 cu ft of gas at \$0.45 per mcf, which equals \$11.25 for the same service. Thus the saving for six hours per day at the full firing rate is \$23.60. During another eight hours per day at half firing rate (modulating) the saving is \$1.95 per hour or \$15.60. This results in a total daily fuel saving of approximately \$40.00. This multiplied by 280 working days for the year

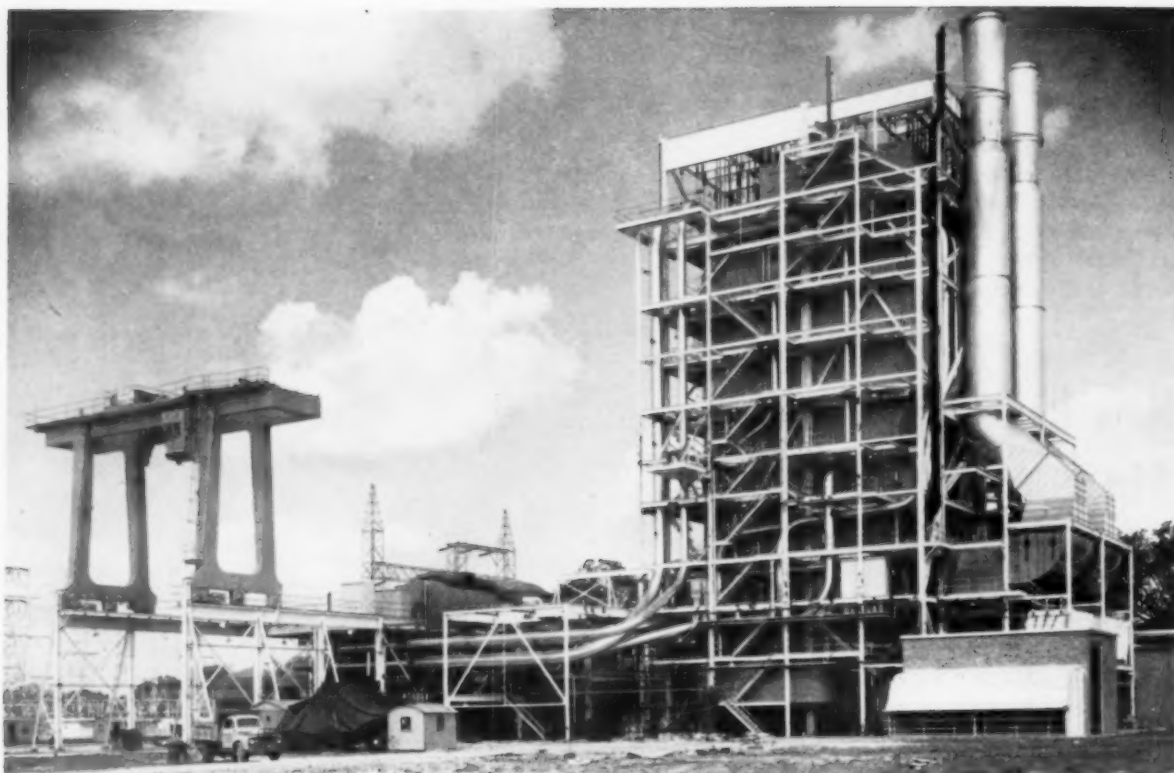
amounts to \$11,200. Giving consideration to the periods in winter when the interruptable gas is cut off, the annual fuel saving is conservatively estimated at \$8,500.00.

The fuel saving, added to the \$1,500.00 repair and maintenance costs no longer required for the old boiler, makes a total of \$10,000.00 per year saved, not counting direct labor saving due to automatic operation.

A deaerating feedwater heater was installed along with the new boiler. This additional equipment serves to maintain feedwater temperature at no less than 215 F, removes oxygen from makeup water, and cuts down on chemical costs for water treatment in removing oxygen, and makes the boiler house the more automatic.

No attendant is needed to operate the new boiler facilities, thereby saving another \$4,200.00 per year; however, this man was given other duties in the plant.

Sale of the new Superior Combustion Industries, Inc., boiler was handled by Kincaid Engineering Co., Gastonia, N. C.



#### Case 9 — Louisiana

### Stainless Steel and Porcelain Enamel Resist Corrosion

**ONE OF THE MOST** modern steam-electric generating plants in existence is shown here at Montz, La., just north of New Orleans, for Louisiana Power & Light Company. Use of stainless steel piping, structural steel framework, and porcelain enameled steel panels fabricated from steel sheets manufactured by United States Steel's Tennessee Coal & Iron Division, give the plant corrosion resistance as well as architectural beauty.

#### Case 10 — Atlanta Food Processing

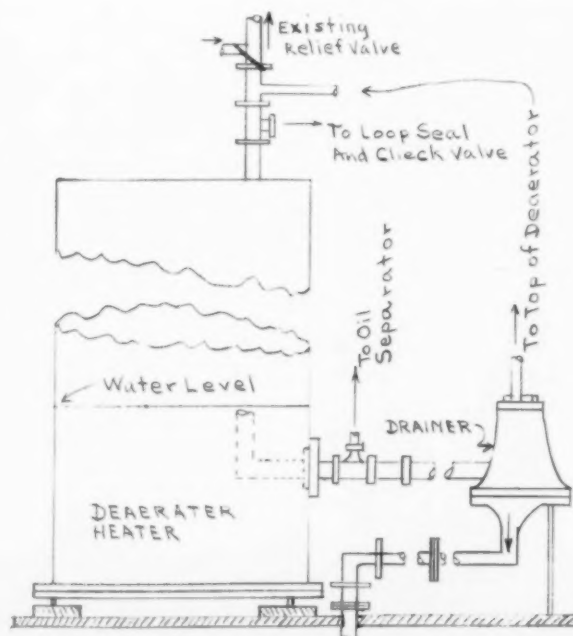
### Controlling Water Level in Heaters

**IMPORTANT** to the efficient operation of deaerator heaters is the maintenance of a constant water level within them. Thus, when the original water level control valve (which had given fluctuating levels) on a deaerator heater at the National Biscuit Company's Atlanta, Georgia plant went bad, a decision to try a different approach was reached.

A 2" Armstrong No. 24 liquid drainer was installed to replace the OEM valve (see sketch). Since the drainer is a ball float type and operates through a compound leverage system, it was reasoned that it would provide the continuous, modulating discharge required on this type of installation.

The reasoning proved sound, and the results speak for themselves: 1/3 lower replacement cost, no maintenance for over two years, and with constant water level now being maintained in the deaerator heater the operation of the heater is more efficient.

By T. H. ABBEY JR.  
Abbey Steam Specialty Co., Atlanta



## How to Get Rid of Dirt in Cooling Tower Water

**SIDESTREAM** filtration has proved of considerable benefit in reducing maintenance, corrosion, and heat exchanger fouling in industrial cooling water systems. It is particularly serviceable in areas of the South and Southwest where fine airborne silt enters the cooling water by way of open towers.

The Permutit Automatic Valveless Gravity Filter shown here is a major of the cooling system at a major Southern public utility.

A similar unit, installed at the Phillips Chemical Company plant

in Etter, Texas, reduced suspended matter in the cooling water system in one week from 2.00 ppm to 0.5 ppm, and the suspended matter has since dropped to barely detectable amounts.

Operation of the cooling water filtration system is simplified by the fact that coagulant aids are seldom required to achieve a high degree of clarification.

By diverting only a small part of the entire flow (generally 1 to 5 per cent) at any given time, the sidestream method does not add to



the pumping requirements of the cooling system. The Automatic Valveless Gravity Filter washes itself automatically without the need for external power source or any regular supervision.

### Case 12 — Baltimore Contractor

## Hole Saw Saves Time

**THE BALTIMORE** office of the Howard P. Foley Company, a nation-wide firm of electrical contractors, had a particularly complex job in connection with their contract on the new Social Security

Building recently completed in Baltimore.

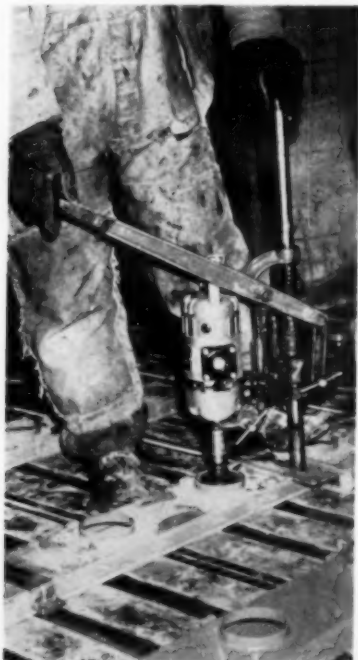
The installation of header ducts in the cellular raceway system required the cutting of 3-inch holes through two thicknesses of metal at intervals of one foot. These ducts were positioned to provide access to the cellular flooring for power and telephone connection outlets. A total of 40,000 holes were drilled in the entire building.

To perform this job on schedule, the Howard P. Foley Company worked out a rig and procedure with Black & Decker equipment. Using a B&D  $\frac{1}{2}$ " heavy-duty drill as the power unit, a special "mobile" drill press was designed. This used the bracket and column of a standard Black & Decker No. 60 bench drill stand with a special clamp on the end of the column which could be quickly fastened to the header duct.

With Black & Decker 3" Hole Saws in the chucks of the  $\frac{1}{2}$ " drills, the operators were able to cut through the header duct and the raceway in one operation. Each hole averaged about 4 minutes to complete: the operator moved the

complete drill press assembly to the next hole in a few seconds and repeated the operation. The photograph shows one of the special rigs in operation.

The Howard P. Foley Company reports that the special rigs helped immeasurably to save time, increase efficiency on the job and to keep pace with the rigid pouring schedule.



### Case 13 — Tennessee

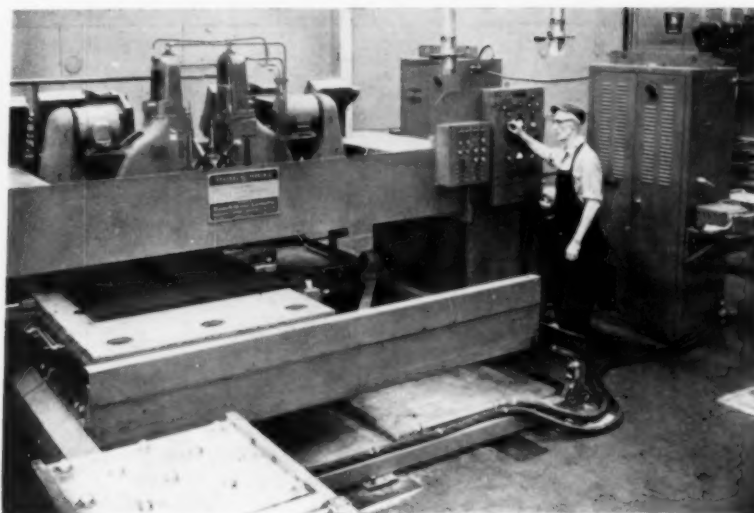
## Traps Solve Coil Freezing Problem

**A LARGE MANUFACTURER** in

Tennessee was having difficulty with coils freezing up when the outside air temperature went below 32 F. The low temperature air passing through the coils caused a heavy condensation rate with a corresponding reduction in steam pressure. This resulted in reducing the condensate and the air handling capacity of the trap.

To overcome this difficulty, a trap with a separate air by-pass and having ample condensate handling capacity was used. There were approximately 100 of these traps installed throughout the plant. The traps selected and installed were V. D. Anderson Heat-Kwik Combination Traps.

## Numerical Positioning Control Cuts Drilling Cost for G. E. Plant



**BY RECOGNIZING** automatic machine tool control as a production system, rather than just a machinery improvement, General Electric's Industry Control department at Salem, Va., has reduced costs of a custom-manufacturing operation by two-thirds.

Itself a manufacturer of control and regulating equipment for process industries, the Salem plant now uses numerical positioning control built by its neighbor, the G-E Specialty Control department in Waynesboro, to achieve savings of more than 60 per cent in drilling bases for steel mill control equipment.

The job of automatically controlling a steel process line is so big and complex, the department explains, that the control system for each must be custom-engineered and custom-built. This is reflected in the base-drilling operation, where an average of only 1.5 units is produced from each set of drawings. Any number of holes from four to 100 must be drilled in an insulating mineral board used to mount components such as contactors, switches, relays, and meters.

To perform the drilling operation, Industry Control department has adopted a specially built multi-spindle turret drill, incorporating two six-spindle drill heads mount-

ed face to face over a 48 x 90 inch table. Operation of both these drilling heads is controlled by a modified Mark II General Electric numerical positioning control, supplied by Specialty Control equipment.

Automatic control has proved itself a valuable investment because of the virtual need for single-unit production, and because Industry Control department analyzed its needs in terms of its over-all production problem, rather than as an individual machining need.

"Our savings would have been far less significant had we considered only the factory-floor advantages of numerical positioning control in this operation," states R. E. Burkett, manager of manufacturing for the Industry Control department. "Instead, however, our manufacturing engineers analyzed each step in our process of translating engineering drawings into finished pieces. It was apparent that the indirect costs involved were a large factor in the total manufacturing cost of each piece."

Formerly, the make-ready for each job involved making a paste-up of a drilling template from engineering drawings. The paste-up was copied by a photographic process and printed to produce the working template.

By replacing this system with an automatic programming device, the department has been able to convert the template to punched tape, programming up to 100 holes in 10 to 15 minutes.

The programmer operator aligns cross-hairs over each hole location on a reproduction of the drawing, and presses a button. The programming device translates this into positioning instructions and punches the tape. Hole size is the only additional information that need be punched in by the operator.

Simplification of the programming system made it possible to use personnel from the photographic process as programmers.

"By extending our automation to the programming of our numerically controlled machine," Mr. Burkett notes, "we were able to gain additional major savings in drafting time, photographic copying processes, and in total make-ready time. In fact, these exceeded the savings we had expected from NPC in production time and the elimination of rejects due to machine operator error."

"As a result of our initial success with automatic control, we are planning to install two other comparable machine tool control systems in our machine castings area later this year," he added.



## Infra-Red Solves Painting Problem

**THE J. B. BEAIRD** Company, Inc., the Southwest's largest manufacturer of fabricated steel and alloy products, had a problem develop in the finishing department in its Shreveport, Louisiana plant. A contract involved manufacturing and finishing components of a large mechanism. While the components passed the customer inspection, a small percentage had to be refinished because the paint job did not pass the "masking tape" test.

Mr. Ralph Schmidt, Beaird's Manager of Production, quickly determined that condensation on the bare metal was occurring in the Finishing Department.

The components when fabricated are brought to the finishing area where they are cleaned in a vat, then they stand in the area awaiting their turn in the paint spray booth. Since this entire area was unheated, condensation would form under high humidity conditions. Mr. Schmidt's problem, therefore, was to maintain the product — while waiting between cleaning and painting — above the dew point, so that satisfactory finishing could be accomplished.

The following conditions prevail: 1) The area utilized for the product between cleaning and painting is 40' by 48' — only a small percentage of the entire building. 2) The building is uninsulated steel construction with many glass areas and several large doors. Some of the doors remain open a good part of the time. One of the doors is adjacent to the finishing area. 3) A railroad siding is on one side of the area, the ends of which are open to the outside.

With the above conditions in mind, careful consideration of various heating methods was made. Convection heating was ruled out for several reasons, and partitions around the finishing department were not practical.

Infra-red energy, because of its



Bright aluminum shields reflect the energy from the back side of the units into the critical area.

basic properties, fulfills the requirements on this job. Radiant energy travels in a straight line at the speed of light (186,000 miles/sec). Also, like light it can be reflected and/or concentrated with properly designed devices. Infra-red is not heat until it is absorbed, and since air is a poor absorber, very little energy is given up to the air. Because of these characteristics it is possible to heat a small area in an otherwise unheated building.

After calculation and consideration of all factors, John Reed Co. of Shreveport recommended that six CR-125 Panelblocs with back shields be installed. Bright aluminum louvers and back shields were specified to reflect the infra-red energy from the Panelblocs downward into the finishing area. With this type installation air movement between the units and the products to be heated has little or no effect on the temperature of the product. The air blows away but since it has absorbed very little heat it does not affect the heating job.

Upon receipt of the recommendation, the plant officials advised that time was critical and issued the order requiring installation by Friday of the same week. The installing contractor, The Shreveport Plumbing Company, was alerted and the Bettcher Manufacturing Corporation of Cleveland, Ohio, manufacturers of the Panelbloc heaters, were requested to rush shipment. To accommodate the early installation the units were shipped by air to Dallas through Atlanta, then by truck to Shreve-

port. The equipment was installed and in use by Friday.

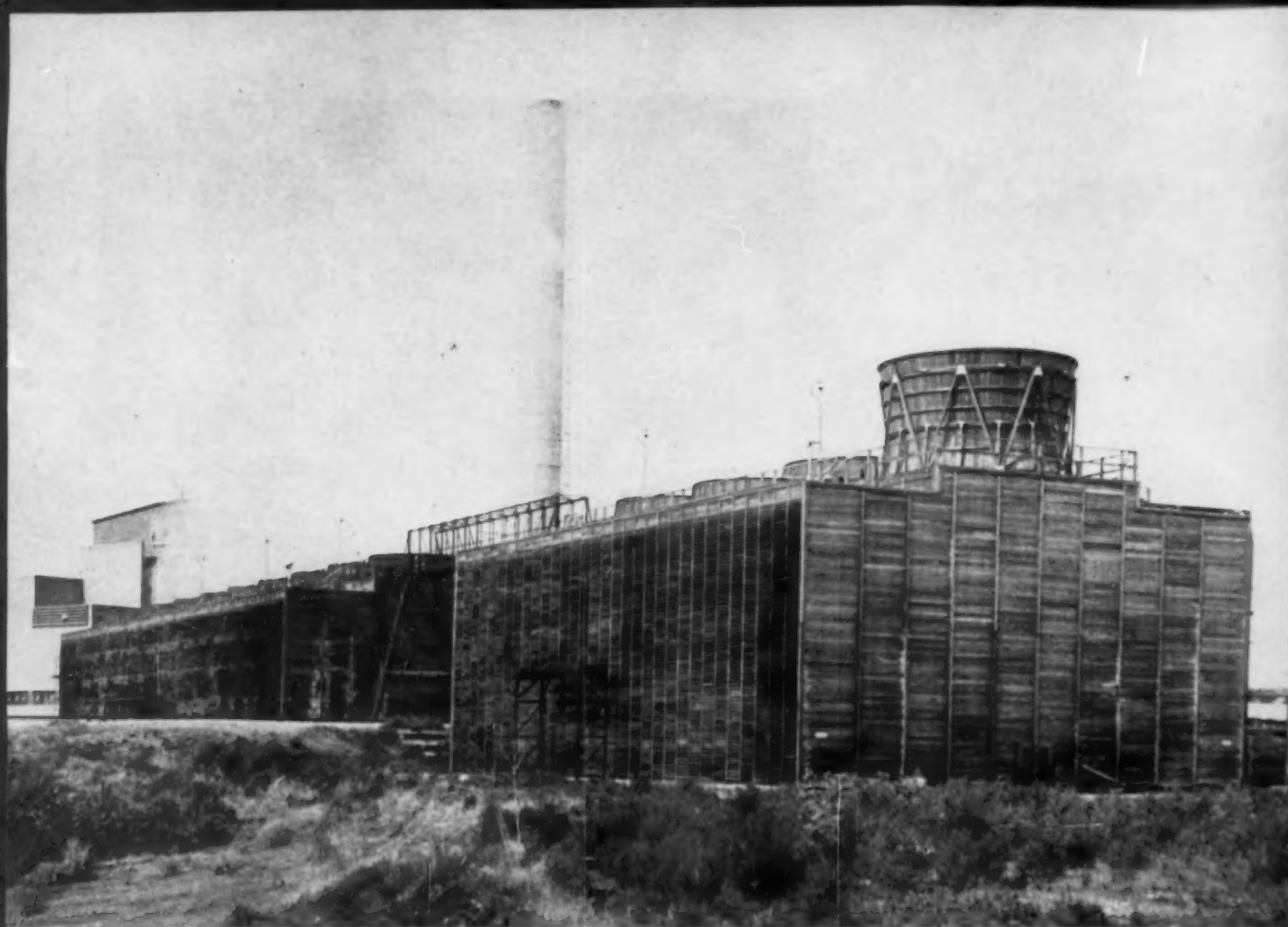
The entire installation was on a trial basis. That is, the customers had the right to return the equipment if they were not satisfied. The trial period was 60 days. Shortly thereafter, the J. B. Beaird Corporation accepted the installation as accomplishing what it was required to do.

## Case 16 — Georgia

### Engineered Lubrication

**PENN-DIXIE**, one of the largest producers of cement in the southeast, recently doubled the capacity of its plant at Clinchfield, Georgia. Close cooperation with its local petroleum products supplier, W. E. Beckham and Gulf Sales Engineer F. D. Jones, Jr., of Perry, Georgia, enabled its Engineering Department and constructors to install and test out, before acceptance, all new equipment employing the proper lubricants.

Shortly before the addition was put into operation, a complete lubrication survey was made by a team of product application engineers from the Gulf's Southern Regional Office in Atlanta. This survey included machinery in the new addition, also the quarry. Despite the diverse equipment throughout this large operation, lubricants were held to a minimum number of brands, consistent with the best lubricating practices.



Addition of a 14-foot velocity recovery stack on old tower produced much needed additional capacity.

#### *Case 17 — Louisiana and Texas Examples*

## **Cooling Tower Capacity Increased by Modernization**

By **WAYNE H. McCALLON**  
Customer Service Department  
The Marley Company

**WHEN NEW PROCESSES** or new equipment increase cooling water requirements beyond the capacity of existing cooling towers, either a new tower can be put "on stream," or the existing equipment can be modernized and upgraded to provide additional cooling water required. In most instances, the latter course is practical and more economical.

The economic advantages of modernizing an older cooling tower are many. No additional land is required — frequently an

important factor in closely confined plant areas. Neither more piping nor additional concrete basin are required. Total cooling tower maintenance is actually reduced.

Another economic factor to be considered when contemplating modernization of an older tower versus purchase of a new one is the corporate budget. Modernization can be charged in many instances as maintenance expense and as such has a tax-reducing effect. On the other hand, a new

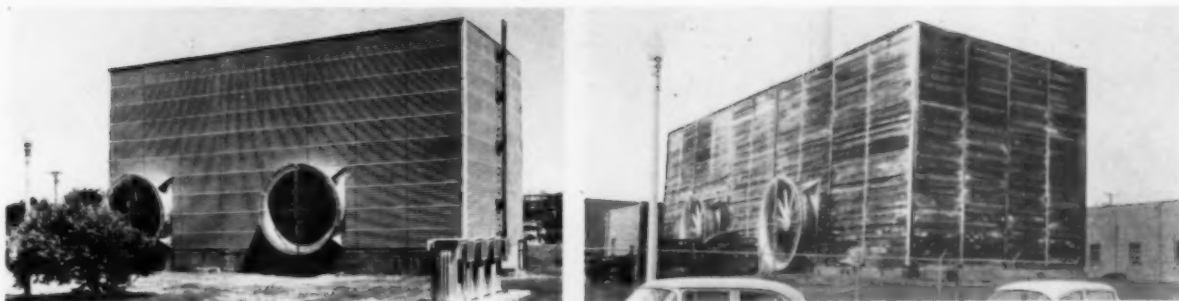
tower is taxable as capital investment.

The capacity of a water cooling tower can be increased by:

- (1) increasing the volume of air which flows through the tower.
- (2) improving distribution of hot water within the tower.
- (3) increasing air-water contact time by improvement of fill arrangement.

These are established cooling tower design principles.

Increased air volume through a cooling tower can be achieved by the following modernization procedures:



Modernization of this tower included refurbishing exterior and replacement of operational components.

1. Install velocity recovery air discharge stacks which can produce an increase in air volume up to 15%.

2. Install new or larger fans of higher efficiency which will result in increased air volume through the tower.

3. Rewind motors to produce higher horsepower. Improvements in insulation and rewinding techniques enable service shops to rewind motors providing capacity increase at a fraction of the cost of new motors of comparable horsepower.

minute. The 17-year-old, 3-cell tower was modernized by installing larger, new fans, larger speed reducers and new 5-foot fan cylinders. This procedure gave them more than the added capacity they needed.

Functionally, the operating efficiency of an existing tower is increased and maintenance expense is reduced by replacement of old, worn out mechanical equipment, fan cylinders and/or filling.

Great strides have been made in the design of hot water distribu-

tion systems and in cooling tower filling arrangements. Both have contributed much to increased performance capabilities of new cooling towers. These same design improvements can be applied on older cooling towers giving them greater cooling capacities than when they were new.

Many cooling towers in the power, process and air conditioning fields have been modernized effectively and their capacities increased by the application of the procedures described above.

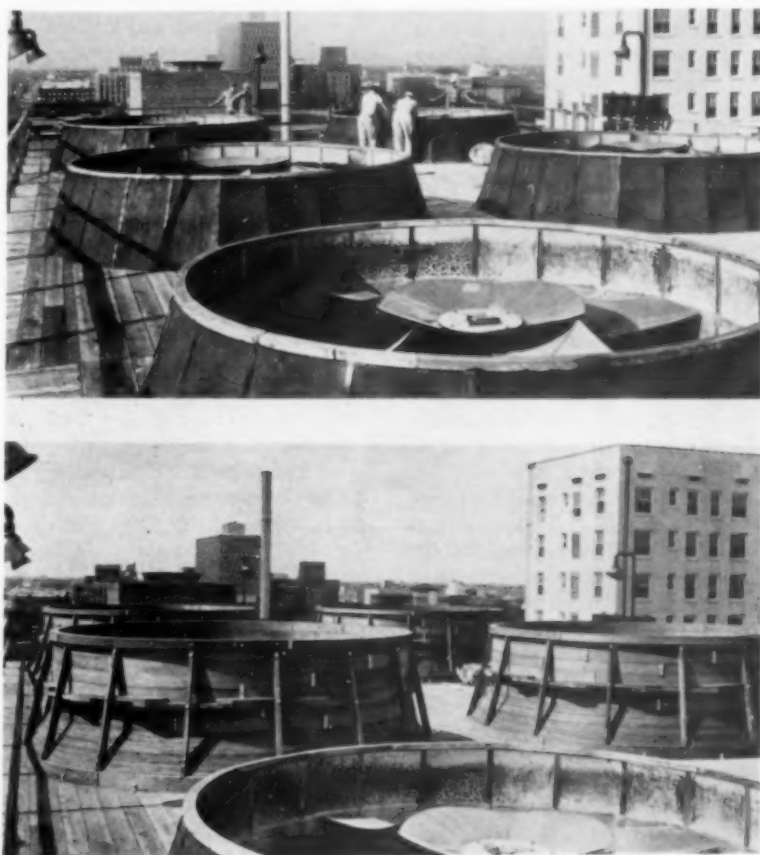
### Examples

Here are two typical examples of how modernization increased the capacity of existing cooling towers.

A petrochemical plant in Louisiana needed more cooling water than the existing 18-year-old, 24-cell tower could provide. Sixteen cells of the tower were modernized by installing larger mechanical equipment and 14-foot velocity recovery stacks. The result was more air through the tower with a consequent increase in capacity of 10%, providing an additional 12,000 gallons of cold water per minute.

An increase in air volume through the tower did the job for a large gasoline plant in Texas, too. The plant needed an additional 2,250 gallons of cold water per

Partial modernization of an old tower (addition of new fans and fan cylinders) can give enough added capacity to accommodate new equipment added to the system it serves. Before and after photos show old and new fan cylinders.





Rigid panels of "stress skin" construction, consisting of exterior grade plywood bonded on both sides with zinc coated steel, are laid on the gridwork. Commercially available tiles are affixed to these panels. The tapered panel edges permit easy removal. Electrical cables in space below panels are easily accessible.

#### Case 18 — Georgia Public Utility

## Flooring System for "Nerve Center"

**THE GEORGIA POWER** Company is ready to make use of whatever electronic brains science may introduce to industry in the next couple of decades. Recognizing the growing use of automation in compiling the rate and billing data for thousands and thousands of customers, two complete floors of the new Electric Building in Atlanta, Georgia, which houses the headquarters of the Georgia Power Company, were designed to be electronic nerve centers.

All of the computers and data processing equipment already installed, plus that which will be installed in the future as availability and need arises, are supported on a special Met-L-Strut flooring system engineered and marketed by Unistrut Products Company, and installed by Unistrut Steel Service Company of Atlanta, Georgia. Made specifically for data processing rooms, the floors present a clean, durable, resilient surface over a structure strong enough to support the heaviest computer units. At the same time an easily accessible space below the floor is provided for cable runs between

components. Electrical outlets can be "spotted" wherever required.

The floor finish is  $\frac{1}{4}$  inch solid vinyl tile cemented to 3 x 3 ft structural panels weighing 50 pounds each. Panel cores are inch-thick exterior-grade fir plywood with 24-gauge zinc coated steel sheets structurally bonded to both faces. All panel edges are tapered to permit easy removal of individual panels from the completed floor by the use of special suction cup lifters. The panel edges are covered with a solid vinyl T-shaped strip with the corrugated stem of the T inserted in a slot in the plywood core. The edge strip is also cemented to the core and covers the exposed edges of the vinyl tile.

#### Supporting Structure

Panels are supported on all edges by a Unistrut P-5500 12-gauge steel channel which measures 1 $\frac{1}{2}$  inches wide by 2-7/16 inches deep. Channels are placed on three foot centers and stringers are used full length in one direction while spreaders, or cross channels, also spaced three feet on center, are cut to fit between

the through members forming a grid system to match the floor panel dimensions.

Screw-jacks placed under each intersection of the grid provide plates on which the channels rest. Spring-held nuts in the channels provide an easy means of securing the grid members in position with bolts through holes in the jack plate. Adjusting nuts on the jack screws permit the system to be leveled in both directions to a maximum deflection of 1/16 inch for a ten foot span. When the system is level, lock nuts on each jack are tightened to prevent any change in the floor height.

In addition to providing for cable runs between units, the space beneath the computer room flooring acts as the plenum chamber for the air conditioning system.

With a strong, even, clean floor for a base, the electronic "thinking machines" at the Georgia Power Company store their knowledge and tick out their information operating at maximum efficiency in an atmosphere of conditioned air supplied through the chamber formed by the floor panels.



LOCKHEED AIRCRAFT CORPORATION, GEORGIA DIVISION FORM 648-2 (6-61)

COOL	PE NUMBER	PROPERTY OR PART NUMBER	TOOL CODE	TOOL NO.	DEPT	CRG	MO	DAY	YR
DESCRIPTION		REFERENCE SPEC	W/O CODE REPAIR C		FREQUENCY				
<div style="display: flex; justify-content: space-between;"> <div> <p>ACTUAL HOURS</p> <p>EMPLOYEE SIGNATURE</p> </div> <div> <p><b>CERTIFICATION AND PREVENTIVE MAINTENANCE RECORD</b></p> <p>1 <input type="checkbox"/> ACCEPTABLE</p> <p>2 <input type="checkbox"/> PHYSICALLY DAMAGED</p> <p>3 <input type="checkbox"/> PHYSICALLY DAMAGED W/O WRITTEN</p> <p>4 <input type="checkbox"/> NORMAL REPAIR</p> <p>5 <input type="checkbox"/> NORMAL REPAIRS W/O WRITTEN</p> <p>REMARKS</p> </div> </div>									
COOL	PE CONTROL NO.	PROPERTY OR PART NUMBER	TOOL CODE	TOOL NO.	DEPT	CRG	ACTUAL HOURS	REFERENCE SPEC	W/O CODE
DESCRIPTION	BASIC	DASH	TOOL NO.	DEPT	CRG	ACTUAL HOURS	REFERENCE SPEC	W/O CODE	REMARKS

LOCKHEED AIRCRAFT CORPORATION, GEORGIA DIVISION FORM 648-3 (2-61)

## METHODS IMPROVEMENT

Case 19 — Lockheed Aircraft, Atlanta

# Cuts Instrument Upkeep 2,580 Man-hours per Year

By R. M. LADY

Industrial Instrument Engineer  
Lockheed Aircraft Corp., Georgia Div.

**TO REDUCE COST** and increase the efficiency of the periodic instrument certification and maintenance program, a review based upon past performance was needed. To confirm this past experience with actual records, it would have been necessary to make a manual compilation of data extracted from approximately 12,000 IBM record cards.

A new IBM form was designed and put into effect that would provide for an automatic "take-off" of necessary information via the IBM machines and would furnish a tabulated written record of this data.

This form provided five numbered squares as designated and defined below. Space was also provided for recording the type of work order, the work order register number, and a "remarks" section. The instrument technicians were instructed to check the applicable square which would then be key punched into the IBM card in the "Repair Code" column.

The following definitions were used for determining the applicable repair code:

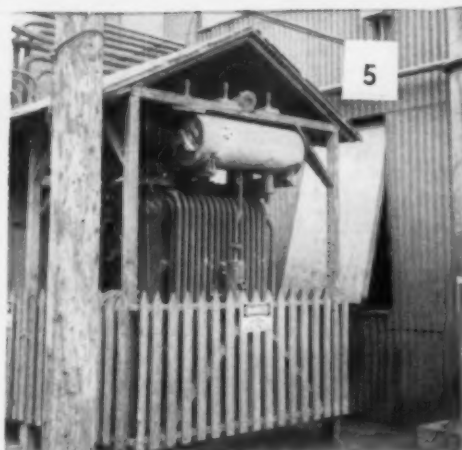
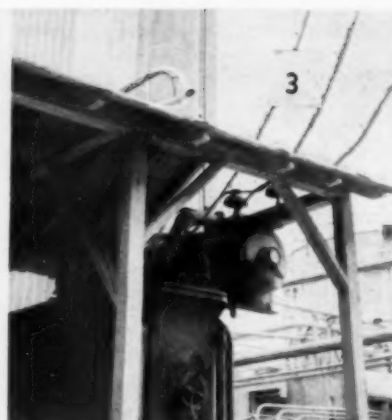
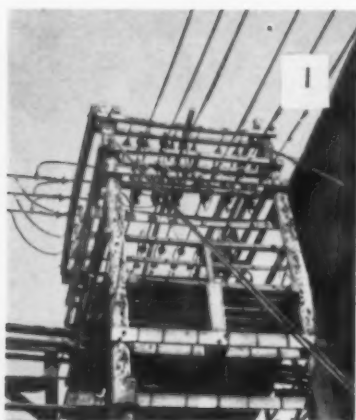
1. Acceptable — requiring no repair or adjustment at time of certification.
2. Physically Damaged — minor damage due to misuse requiring less than 15 minutes for repair.
3. Physically Damaged, W/O written — damage due to misuse requiring more than 15 minutes for repair. Such work to be accomplished on a separate work order and the number recorded on the IBM card with a brief description of condition recorded in the "Remarks" space.
4. Normal Repair — minor adjustments or replacement of parts due to normal usage and requiring less than 15 minutes to isolate the trouble and repair.
5. Normal Repair, W/O written — repair, replacement, or recalibration requiring more than 15 minutes including time for isolating trouble. Such work to be accomplished on a work order, and the number recorded on the IBM card with a brief description of the work performed.

A schedule has been established in the Tabulating Department so

that twice a year all completed IBM cards are processed automatically, resulting in a tabulated list of all periodic certifications. This list is arranged so that all like tools or equipment will be listed together, which will facilitate and expedite the screening operation.

On the initial run of this operation, all tools or equipment that required normal repair only (Code 4), and this less than 20% of the time, were listed for investigation as to the possibility of reducing the certification frequency. Tools or equipment that required Code 4 and Code 5 more than 50% of the time were listed for investigation as to the possible need of redesign, replacement, or an increase in the certification frequency.

Of the 1,381 items of functional test equipment submitted for investigation to the applicable Planning Departments, the certification frequency of 495 items was decreased, the certification frequency of 23 items was increased, and the requirements for 12 items were cancelled. The net savings due directly to this project including the time for its implementation has amounted to 2,580 man-hours per year.



## Case 20 — Arkansas

### Insulators Eliminated

**INSULATOR** contamination can be a costly maintenance problem, as well as an expensive production loss. The contamination shown in Figures 1, 2 and 3 is a result of a sintering process containing sodium aluminate ( $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3$ ) and calcium silicate ( $2\text{CaO} \cdot \text{SiO}_2$ ).

The sintering plant of Reynolds Metals Company, Bauxite, Arkansas, had to shut down approximately every thirty days to hand-clean insulators on a 4.1 kv system, using steel wool and wire brushes. Over-insulating had been attempted as a solution to this problem. The additional insulators prolonged the cleaning cycle, but a longer cleaning time was required.

A small sand blast machine which blows a 400 mesh material onto the insulators and cleans them while in service was obtained.

By **JOHN PETZ**

Reynolds Metals Co.  
Bauxite, Arkansas

This method was very successful, but occasionally cracked insulators caused by "tracking" were found. This resulted in shutdowns to change insulators.

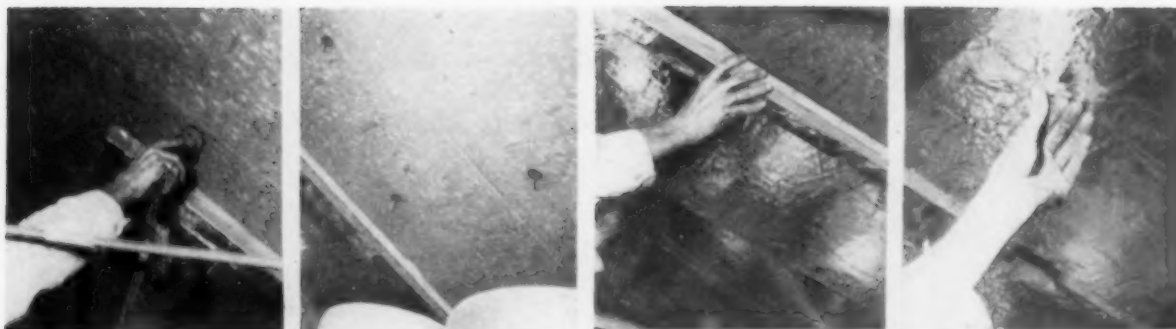
Engineering studies revealed that these problems could be eliminated by the use of armor insulated cable. However, this decision brought on two additional major problems — termination to the bare conductor and to the transformer. As a solution, all primary bushings were removed from the transformer and a short piece of V.C. armored cable was connected to the transformer (see Fig. 4). This eliminated the bushing as well as some troublesome oil leads at the bushings.

At a point above the expansion tank (see Fig. 5), a NEMA 12 junction box was mounted to con-

nect the run of butyl rubber armored cable to the V.C. armored cable, which is impervious to oil in the transformer. The box was mounted higher than the expansion tank to prevent oil syphoning into the V.C. cable. An inverted pothead with skirts was used to connect to the bare transmission line as shown in Fig. 6.

It has not been necessary to clean insulators during five years of service using this installation. Dust accumulation has been negligible. A short distance from the pothead the 4160 volt fuse disconnects were installed in a steel enclosure and, in some cases, disconnects were ganged in an enclosed switch house.

This is an economical installation in regard to maintenance and insulator replacement. In addition there has been considerable reduction in cost by eliminating many unscheduled power outages and the resulting loss of production.



From left to right: Spot-welding pins, the pins in place, impaling the insulation, placing the clips.

### Case 21 — Kansas Factory

## Insulation of a Prefabricated Steel Building

**THE INSULATION** of the roof of a prefabricated steel building used for manufacturing is always desirable but is not easily accomplished. It is desirable, of course, in the winter to effect fuel economy. It is also desirable because of the tremendous heat release to the interior of the shop, when the roof is exposed to the direct ray of the summer sun. This greatly affects the comfort of the workers which, of course, adversely affects production.

The insulating of our roof was accomplished by spot welding special nails to the underside of the roof and impaling sheets of 1" thick ridged fiber glass insulation

to these. A special clip was then placed on the nail holding the insulation firmly against the underside of the roof.

This is the only practical method the writer has found to insulate this kind of a roof.

An aluminum foil facing was applied to the insulation before installing on the roof. Tabs were left on two edges of each sheet, and after attaching to the roof, these tabs were lapped over and glued down, forming a continuous vapor seal on the entire underside of the roof. This aluminum covering not only served as a vapor barrier but did much to improve the general lighting of the shop as it reflected

light back down into the work area.

Without any insulation our roof collected much condensation which sometimes became excessive and dripped down into the work area. This was especially annoying in our Shipping Department, where many of our products were stored in cardboard boxes.

*Before accepting the above article, the editors asked the author if he had observed any damage to the galvanizing due to spot-welding. His reply follows:*

"We asked the same question. But samples of galvanized sheets were spot-welded for us, and there was absolutely no damage to the galvanized coating. We checked our roof as the job progressed, and cannot see any damage whatsoever."

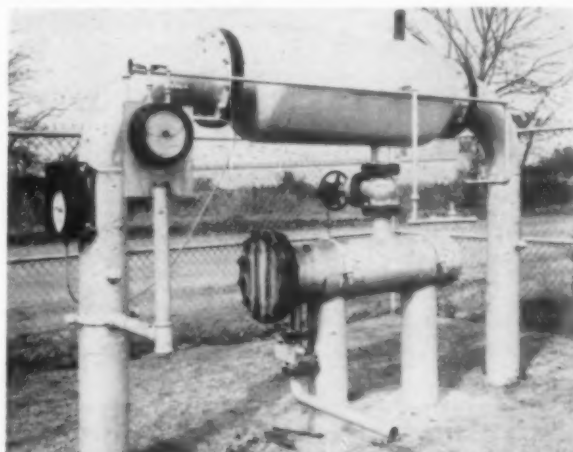
By L. W. NICHOLS  
Exner-Dodge, Inc.  
Coffeyville, Kans.

### Case 22 — Alabama Gas Company

## Pilot and Burner Stoppage Eliminated

**CUSTOMERS** of a large Alabama gas utility in an industrial area experienced pilot and burner stoppage due to dust accumulation. The gas company solved the problem by installing a V. D. Anderson Hi-F Gas Line Scrubber in the feeder main supplying the industrial area. Meters were also protected from the heavy dust.

This purifier is removing  $\frac{1}{4}$  to 15 quarts of dust per day, depending on flow fluctuation. Estimated flow rate range is from 30,000 to 300,000 cfh of natural gas at 12 to 13 psig. Customer complaints and dust accumulation have ended.





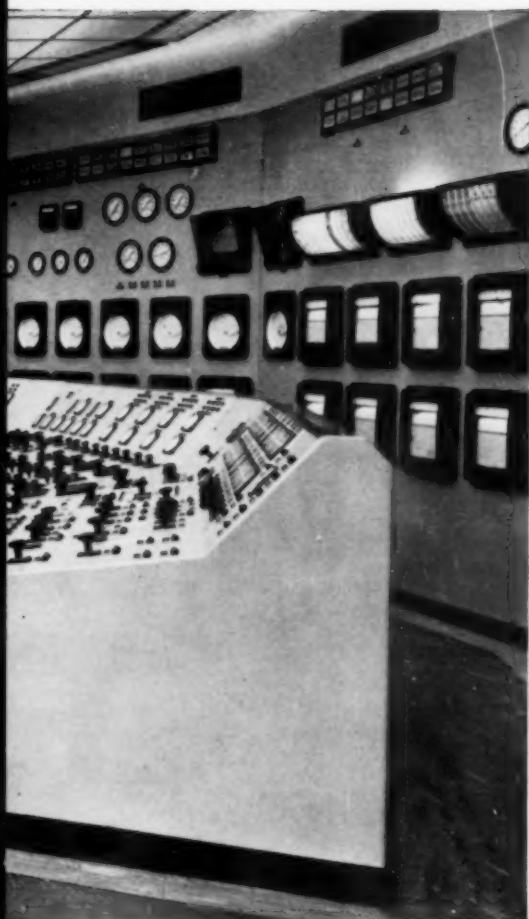
## IT'S BAILEY FOR AMERICA'S

1959 STEAM-ELECTRIC PLANT HEAT RATES FROM FEDERAL POWER COMMISSION REPORT S-143

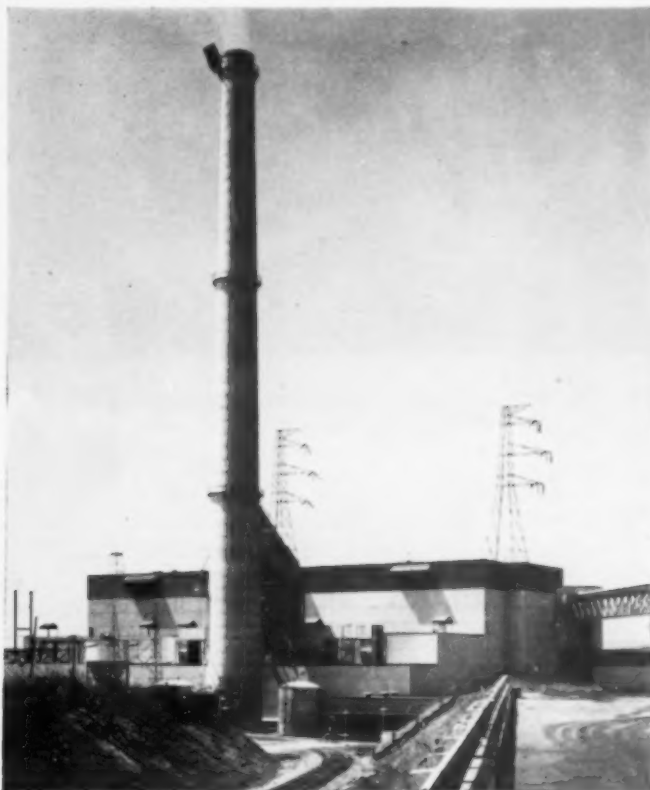
	Btu/kw-hr	Meters	Combustion Control	Feed Water Control	Superheat Control
1. Dickerson (Potomac Electric Power Co.)	9,007	B	B	B	B
2. Clinch River (Appalachian Power Co.)	9,011	B	B	B	B
3. Kanawha River (Appalachian Power Co.)	9,098	B	B	B	B
4. Silas McMeekin (South Carolina Electric & Gas)	9,130	—	—	—	—
5. Muskingum River (Ohio Power Co.)	9,170	B	B	B	B
6. River Rouge (The Detroit Edison Co.)	9,170	—	—	—	—
7. Clifty Creek (Indiana-Kentucky Electric Corp.)	9,173	B	B	B	B
8. G. G. Allen (Duke Power Co.)	9,174	B	B	B	B
9. Tanners Creek (Indiana & Michigan Electric Co.)	9,176	B	B	B	B
10. Shawville (Pennsylvania Electric Co.)	9,179	B	—	—	B
11. Kammer (Ohio Power Co.)	9,203	B	B	B	B
12. St. Clair (The Detroit Edison Co.)	9,250	B	B	B	B
13. Kyger Creek (Ohio Valley Electric Corp.)	9,284	B	—	B	B
14. Portland (Metropolitan Edison Co.)	9,322	—	—	—	—
15. Oak Creek (Wisconsin Electric Power Co.)	9,336	B	B	B	B
16. Bayshore (Toledo Edison Co.)	9,365	B	B	B	B
17. Milliken (N. Y. State Electric & Gas Corp.)	9,374	B	—	B	—
18. Philip Sporn (Appalachian Power Co.)	9,381	B	B	B	B
19. John Sevier (Tennessee Valley Authority)	9,390	—	—	—	—
20. Mandalay Beach (Southern California Edison Co.)	9,397	B	B	B	B
21. Gallatin (Tennessee Valley Authority)	9,420	—	—	—	—
22. Huntington (Southern California Edison Co.)	9,436	B	B	B	B
23. Colbert (Tennessee Valley Authority)	9,460	B	B	B	B
24. Will County (Commonwealth Edison Co.)	9,460	B	—	B	B
25. Agua Fria (Salt River Project A.I.F. Dist.)	9,473	B	B	B	B
26. Salem Harbor (New England Power Co.)	9,485	B	B	B	B

\*per 1959 Heat Rates reported by FPC





Bailey Controls for combustion, feed water and steam temperatures at the Dickerson Generating Station of Potomac Electric Power Co. The Federal Power Commission reported a 1959 heat rate of 9007 Btu per kw-hr, ranking it as No. 1 plant in efficiency in the United States.



## NO. 1\* STEAM PLANT

and for 20 out of the next 25 "most efficient" plants, too

Most efficient power plant in 1959, as rated by the Federal Power Commission, was Dickerson Station of Potomac Electric Power Co. And for measuring and controlling functions that helped attain this record, Dickerson relies on Bailey Meters and Controls.

Moreover, in 21 out of all 26 "most efficient" plants, with heat rates under 9500 Btu per kw-hr, Bailey Meters and Controls are used for some or all functions.

Why? The reasons aren't hard to find. Bailey engineers have worked hand-in-hand with leading power engineers for more than 45 years to advance steam-plant efficiency rates . . . have pioneered the research and development of improved measurement and control techniques that have produced much of today's high

reliability of steam-plant operation . . . have simplified and verified instrumentation and control systems to the point where automation can be approached confidently.

And now, working to extend the benefits of automation over the full range of plant operations, Bailey offers systems incorporating advanced techniques for scanning, alarming, logging, computing, digital logic and sequencing . . . all co-ordinated with established analog equipment to provide maximum safety, economy and reliability . . . all compatible with the needs of power management, technical and nontechnical.

Ask your nearby Bailey District Office or Resident Engineer how new Bailey concepts and advanced systems techniques may be applied to your operations.

A-164-2

*Instruments, controls, and systems*

# BAILEY METER COMPANY

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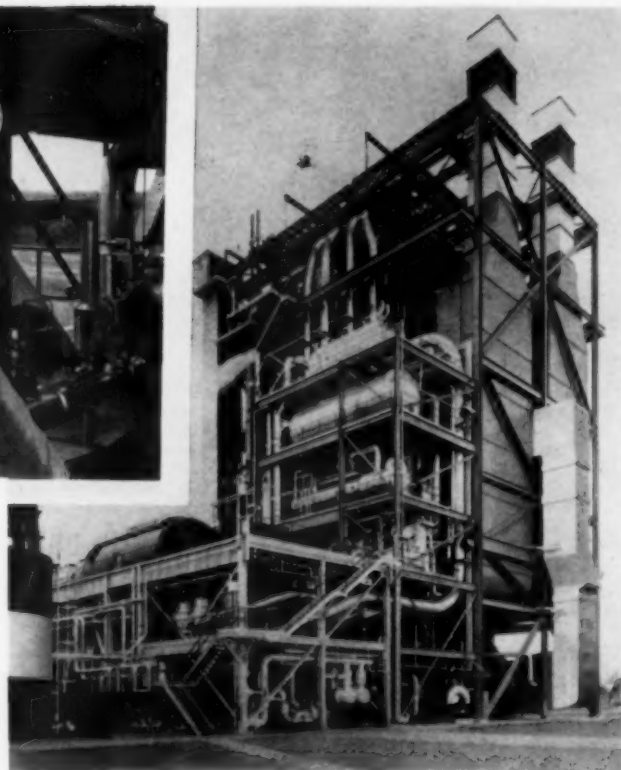
In Canada—Bailey Meter Company Limited, Montreal





The 125 megawatt outdoor installation operates at 1875 psi and 1005 F.

Three-element feedwater control was left on automatic during a generator trip-out. Inspection of charts afterward showed that the system had maintained proper drum level during the two-hour outage and the complete shutdown, start-up cycle.



#### Case 23 — Texas Power & Light Co.

## Automatic Response to Rapid Load Swings

**AUTOMATIC** response to rapid load swings highlights the performance of boiler control systems installed at the Stryker's Creek Station of Texas Power & Light Co.

The station utilizes outdoor construction. Consequently, most of the control systems, manufactured by Hagan Chemicals & Controls, Inc., are fully exposed to temperature and moisture changes. This exposure has not affected the performance of the systems, as demonstrated by their fast, accurate response to load swings on full automatic.

The boiler, arranged for natural gas firing with oil as a standby, is a 1,200,000 lb/hr Babcock and Wilcox unit operating at 1,875 lb pressure and 1005 F. Hagan systems include automatic combustion control, three-element feedwater con-

trol, and all principal metering.

Stryker's Creek Station operates on automatic load control, meeting the many load swings caused by varying demand. Station personnel agree the best feature of the Hagan automatic control equipment is the speed and accuracy with which it responds to these load changes.

The ability of the controls to stay on automatic during abnormal conditions is another important consideration in evaluating performance of a control system. The station experienced an unexpected generator trip-out, during which the three-element feedwater control system was left on automatic.

Inspection of charts after the difficulty was overcome showed that the feedwater system had maintained proper drum level throughout the two hour shutdown, even though the system went

through the complete shutdown, re-start cycle.

Hagan engineers attribute this performance to the fact that the drum level and steam flow meters are compensated, while the system has a unique built-in level monitor circuit. Of especial interest is the use of degrees superheat rather than total steam temperature as the basis for compensating steam flow measurement.

Another feature gives the unit the ability to easily meet demanding load changes. This comes from the circuit arrangement which establishes gas burner differentials and windbox pressures in parallel from the Hagan master sender. Because these two factors move together there is no lag in meeting load changes. Fuel/air ratio measurement is applied to the windbox differential for a final correction.

**YARWAY***news briefs*

from **Yarnall-Waring Company, Philadelphia 18, Pa.**  
 ATLANTA OFFICE: 453 IVEY BUILDING, 3330 PEACHTREE ROAD, ATLANTA 3, GEORGIA

# PROVEN DEPENDABILITY



## MORE THAN 16,000 INSTALLATIONS ATTEST TO SUCCESS OF YARWAY REMOTE LIQUID LEVEL INDICATORS

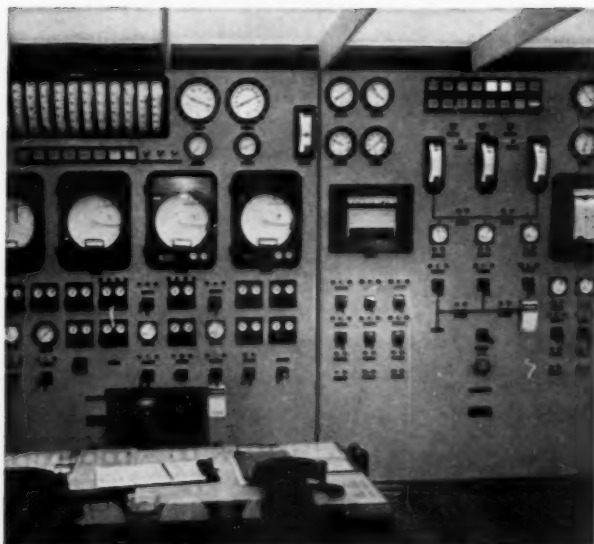
Widespread use of remote liquid level indicators for boiler water level applications, many within ASME Boiler Code requirements as they pertain to installations over 900 psi, have focused attention on the outstanding service record of Yarway Indicators.

*More than 16,000 Yarway Remote Liquid Level Indicators are in successful service throughout industry — hundreds are operating in place of one of two required gage glasses on higher pressure boilers as permitted by the code.*

Briefly, these features are responsible for Yarway Indicator's dependability—and success:

- Readings are *instant and accurate* because indicator is operated by the boiler water itself
- Pointer mechanism is never under pressure
- Brilliant, wide-vision dial makes readings easy from any point in a 180° arc around the indicator—and at considerable distances

Write for Bulletin RI-1825 (pressures to 700 psi), or Bulletin RI-1826 (over 700 psi).



## A FEW TYPICAL USERS

### INDUSTRIAL PLANTS

WEYERHAEUSER COMPANY  
 REPUBLIC STEEL CORP.  
 FORD MOTOR COMPANY  
 UNION BAG & PAPER COMPANY  
 WESTINGHOUSE ELECTRIC CORP.  
 GENERAL ELECTRIC COMPANY  
 STAUFFER CHEMICAL COMPANY  
 WILSON & COMPANY  
 U. S. STEEL COMPANY  
 GENERAL MOTORS  
 MOBIL OIL COMPANY

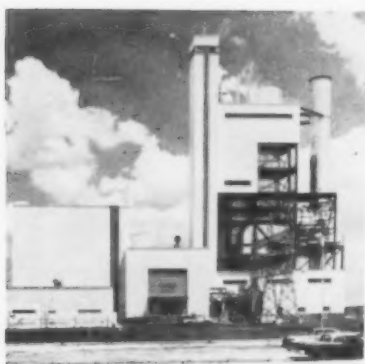
### UTILITIES

COMMONWEALTH EDISON  
 IOWA ILLINOIS GAS & ELECTRIC  
 CENTRAL ILLINOIS PUBLIC SERVICE

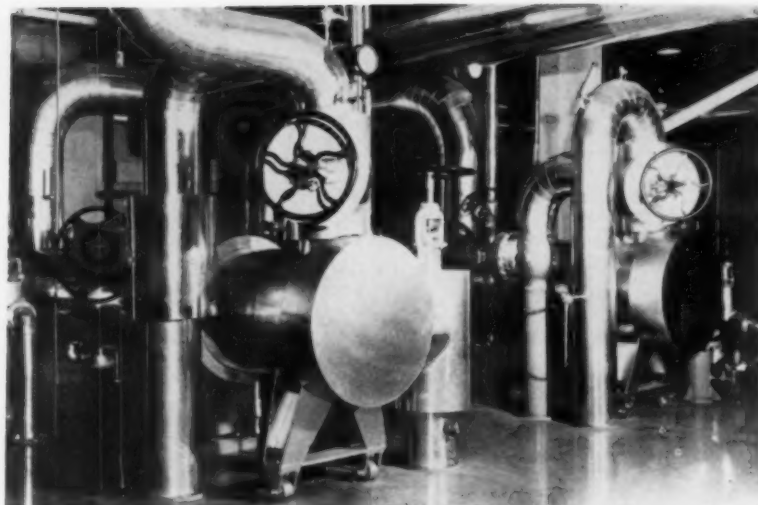
ILLINOIS POWER CO.  
 WISCONSIN POWER & LIGHT  
 CONSUMERS POWER CO.  
 (JACKSON, MICH.)  
 NORTHERN STATES POWER CO.  
 PUBLIC SERVICE OF INDIANA  
 INDIANAPOLIS POWER & LIGHT  
 IOWA ELECTRIC LIGHT & POWER  
 NEBRASKA POWER  
 NEW ENGLAND POWER  
 ROCHESTER GAS & ELECTRIC CO.  
 PENNSYLVANIA ELECTRIC CO.  
 (ERIE, PA.)

OMAHA PUBLIC POWER DISTRICT  
 CENTRAL ILLINOIS GAS & ELECTRIC  
 NARRAGANSETT ELECTRIC CO.  
 LOUISIANA POWER & LIGHT  
 HARTFORD ELECTRIC LIGHT CO.  
 POTOMAC ELECTRIC POWER CO.

*Four Yarway Remote Liquid Level Indicators installed at new Mid-West utility.*



Feedwater heaters at Nichols Station of Southwestern Public Service Co., Amarillo, Texas.



#### Case 24 — Southwestern Public Service Company

### Long U-Bend Tubes Give High Operating Economy

**FEEDWATER HEATERS** play an important role in the efficient operation of a steam power station—and with today's more demanding conditions, the trend is to the use of long-length U-bend tube bundles in these higher pressure, higher temperature heat exchangers, according to Anaconda.

U-bend tube design reduces the number of tube joints to one-half. Each U-bend tube takes care of its own expansion stresses. There's

no floating head—one less gasketed joint—all resulting in a more economical, more compact heater.

Now Anaconda makes heat exchanger tubes to 100 feet. This means U-bend tubes with legs approaching 50 ft are available. And the radius of the bend can be as small as  $1\frac{1}{2}$  times the diameter of the tube. Dual-gage tubes are made with extra wall thickness in the area of the bends, to cut cost and weight.

The four feedwater heaters at Nichols Station of Southwestern Public Service Co., Amarillo, Texas, use a total of 1,692 Anaconda U-bend tubes of Arsenical Admiralty-439. Griscom-Russell Co. designed and built the heaters. U-bend bundles of longer, smaller diameter tubes provide a more effective surface, make possible more compact units. The heaters operate at 200 psi, 450 F.

#### Case 25 — Houston, Texas

### Space Saving Transformer Station



**THREE 500-KVA**, single-phase, 7200/12, 470-wye to 240/480-volt transformers were installed by the Houston Lighting and Power Company to provide service to the new Cook Heat Treating Plant in Houston, Texas.

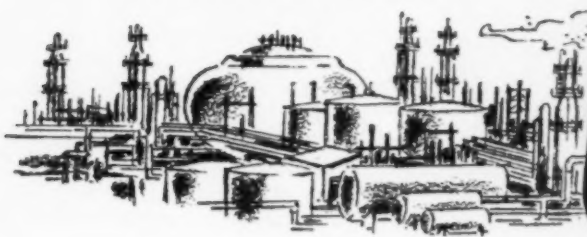
The transformers, supplied by the Westinghouse Electric Corporation, are mounted on an 18-foot rack, 20 feet off the ground. The rack is located in a narrow easement between the road and the building. The restricted width of the easement made construction of a ground-type substation difficult and more expensive.

Houston Lighting and Power used their new method of connecting the secondary buses on the rack. This new procedure of continuous cable runs eliminates the many fittings which were a corrosion problem and improves appearance of the installation.



# Portable **MINIMITE**<sup>®</sup> Goes Anywhere

**for Accurate  
Temperature - Millivolt  
Measurement**



Take accurate temperature-millivolt measurements wherever you go—laboratory, plant or field—with the rugged, compact, portable "MiniMite". Moderately priced, the "MiniMite" (null-balance potentiometer pyrometer) weighs just 3½ lbs., measures just 4" x 5" x 6", provides ¼ of 1% of scale accuracy with a long 23.6" double range scale. Widely spaced scale graduations facilitate easy, accurate reading. A standard flashlight battery provides standardization.

## **Measure Temperatures Directly**

Connected to a thermocouple, the "MiniMite" provides accurate temperature indication, anywhere. It is used for standard checking and calibrating procedures. Automatic cold-junction compensation is built-in.

## **Measure Millivolts Directly**

Any transducer with a dc millivolt output can be checked quickly with the "MiniMite".

## **Calibrate Other Instruments**

The "MiniMite" can be used to check or calibrate potentiometer or millivoltmeter type recorders, indicators, controllers, easily—with little or no extra equipment.



*Temperature  
Measuring Systems  
and Components*

**20 YEARS**

## **Special Design'**

An adaptation of the "MiniMite", called the Airline "MiniMite", is made to quickly check dynamic performance characteristics of jet engine exhaust temperatures, E.G.T. spread or average and calibrate cockpit indicators. It also can be used as a source of variable dc millivolts.

## **72 Double Range Scales**

Range Scales for the "MiniMite" can measure temperatures from minus 450°F. to plus 3200°F. with all standard thermocouple materials, including various Platinum-Rhodium combinations. Many millivolt scale ranges are available. The double range scales are available with two different thermocouple calibrations, combinations of a temperature and millivolt range, or a single temperature or millivolt scale.

## **Operation Is Easy**

Anyone can obtain accurate readings quickly. Connect the "MiniMite" to a sensing element or instrument to be checked, standardize and adjust for readings.

You can have delivery of the model, and range scales you need promptly, many are carried in stock.

**Write today for information—Instrument section 64-135**

**THERMO ELECTRIC Co., Inc., Saddle Brook, New Jersey**  
In Canada: THERMO ELECTRIC (Canada) LTD., Brampton, Ont.

# FIRST FOR EFFICIENCY



## TODD THERMO "DIRECTAIRE" HEATER

### COMPLETE SINGLE PACKAGE UNIT

#### LOWEST-COST HEATING

#### HEATING & VENTILATING

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FACTORIES • WAREHOUSES

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MANUFACTURING  
PROCESSES

**FLEXIBILITY** at minimum cost—as completely self contained heating system or in conjunction with existing heating and air conditioning (same ducts can be used). Easy installation, floor or overhead, with fully wired control panel ready to connect.

**TROUBLE-FREE** performance with high efficiency output of warm air and ventilation at correct sustained volume. For every type of space heating or for manufacturing processes under strict thermostatic control, "DIRECTAIRE" is the system with "built-in" economy.

WRITE FOR "DIRECTAIRE" BOOKLET 30X

# TODD PRODUCTS

A DIVISION OF TODD SHIPYARDS CORPORATION

Sales and Engineering: Columbia and Halleck Sts., Brooklyn 31, N. Y.

Manufacturing: Green's Bayou, Houston, Texas

Case 26 — Texas

## Demineralized Water

## Solves Plastic Bag

## Manufacturing Problem

**TEXAS PLASTICS INC.,** Elsa,

Texas was losing some 20 to 30 dollars per day in spoilage of plastic film due to build up of solids in its processing water. Costly troubles were also being experienced in manufacturing operations as a result of impurities in the water.

The company's manufacturing process calls for the use of water in cooling plastic film by means of internally water cooled chill rolls on extruders, flexographic printing presses, and bag making machines. The extruder screws are also internally water cooled.

The cost of the chill rolls, extruder screws and other equipment that come in contact with water runs into many thousands of dollars. It is essential to protect such expensive equipment from the harmful deposits caused by water impurities. Without proper water treating facilities, down-time losses, plus the cost of acid cleaning would be prohibitive.

These costly manufacturing and processing troubles were corrected through the use of demineralized water, provided by mixed-bed Elgin Ultra-Deionizer equipment. The demineralized water, being free of all harmful solids, cannot cause trouble.

Prior to passing through the deionizer equipment, the water is first softened by an Elgin Water Softener, then passed through Elgin Activated Carbon Filters to remove all organic contamination. The water also passes through a cooling tower and here again the treated water pays dividends in keeping the cooling tower clean and efficient.

This is typical of the countless industrial applications being found today for properly treated water, and shows how water conditioning pays off in savings as well as in better production.

now it's

# **DETROIT VIBRA-GRATE STOKER and DETROIT-TAYLOR STOKER**

Vibra-Grate and Taylor Multiple Retort Stokers formerly manufactured by American Engineering Company of Philadelphia are now and will continue to be manufactured, sold and serviced by Detroit Stoker Company, Monroe, Michigan.



DETROIT VIBRA-GRATE STOKER

All stoker activities of American Engineering Company, a division of United Industrial Corporation, have been transferred to Detroit Stoker Company, Monroe, Michigan where communications relating to all types of stokers formerly manufactured by American Engineering Company should be directed.

Vibra-Grate and Taylor Stoker users, present and future, will benefit through:

- Enlarged engineering and service staffs
- Modern manufacturing facilities, centrally located
- District sales offices or representatives in more cities
- Over 60 years of stoker experience
- Continuing research and development programs

STOKERS FOR BOILERS FROM 3,000 TO 500,000 POUNDS OF STEAM PER HOUR CAPACITY.

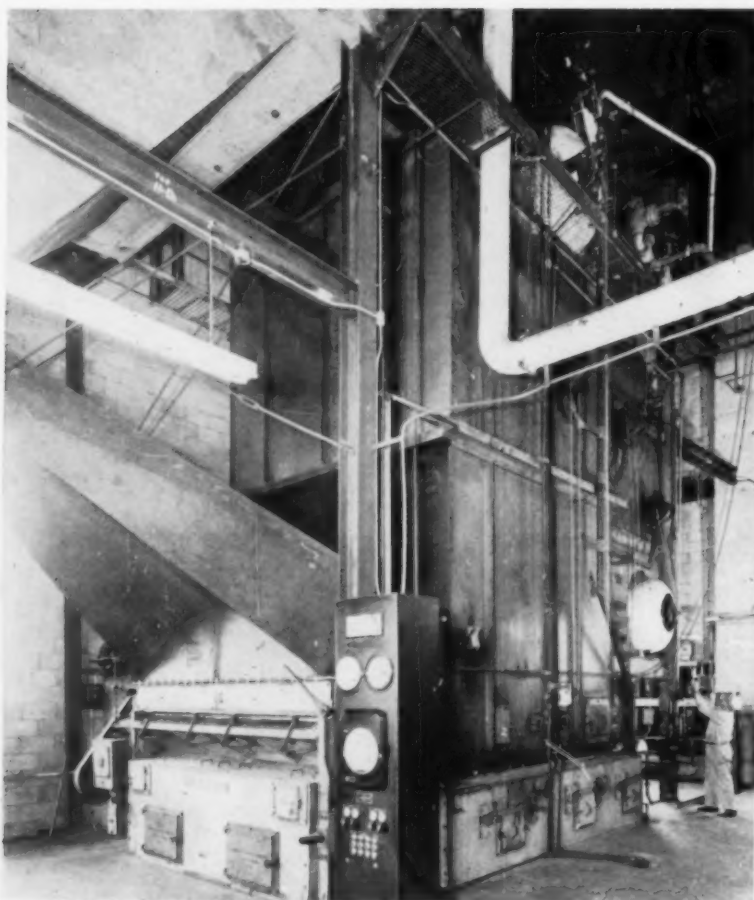
**DETROIT**  
—SINCE 1898—  
**STOKERS**

## **DETROIT STOKER COMPANY**

DIVISION OF UNITED INDUSTRIAL CORPORATION

MAIN OFFICE AND WORKS • MONROE, MICHIGAN

District Offices or Representatives in Principal Cities



**A STEAM BOILER** was the first purchase in the planned ten year expansion of the Spalding Laundry & Dry Cleaning Co., Louisville, Ky.

A 13-year-old unit had been under a heavy load and a breakdown would have had a serious effect upon the business since no other plant or plants in the area could have handled their work load. Now operating two shifts, modernization of the dry cleaning, the laundry and linen departments, when completed, will enable the plant to return to one shift operation.

The new boiler, manufactured by Henry Vogt Machine Co., is of 40,000 pounds steam per hour capacity, designed for 200 pounds pressure, and operating at 160 pounds. The unit has furnace water walls and is equipped with a chain grate stoker and Hagan controls.

Substantial fuel savings have been achieved, since the new boiler burns less expensive coal than that required by the old unit.

A Skinner steam driven generator produces 75% of the electric power, and the exhaust steam from the engine heats 200,000 gallons of water daily for all the needs of the plant.

## Case 28 — Houston Post

# Non-Slip Coating for Truck Clamps

**BY SURFACING** worn clamps on lift trucks with a bonding resin impregnated with grit, The Houston Post, Houston, Texas, has eliminated frequent and costly metalizing of these parts.

The clamp trucks are used in removing 1,650-lb paper rolls from railroad boxcars to storage areas near the presses. The weight of the rolls and the continuous activity of the trucks soon wears the manufacturer's non-slip material from the clamp surfaces.

Prior to the use of the impregnated resin, the Post maintenance staff dismantled the clamps and sent them out for metalizing — a process requiring several days and

costing some \$35 per set of clamps.

After a successful application of the resin — Dura-Grip — to floors of the Post Stereotype Department, W. H. Muller, purchasing agent, believed that the product would prove an effective substitute for metalizing.

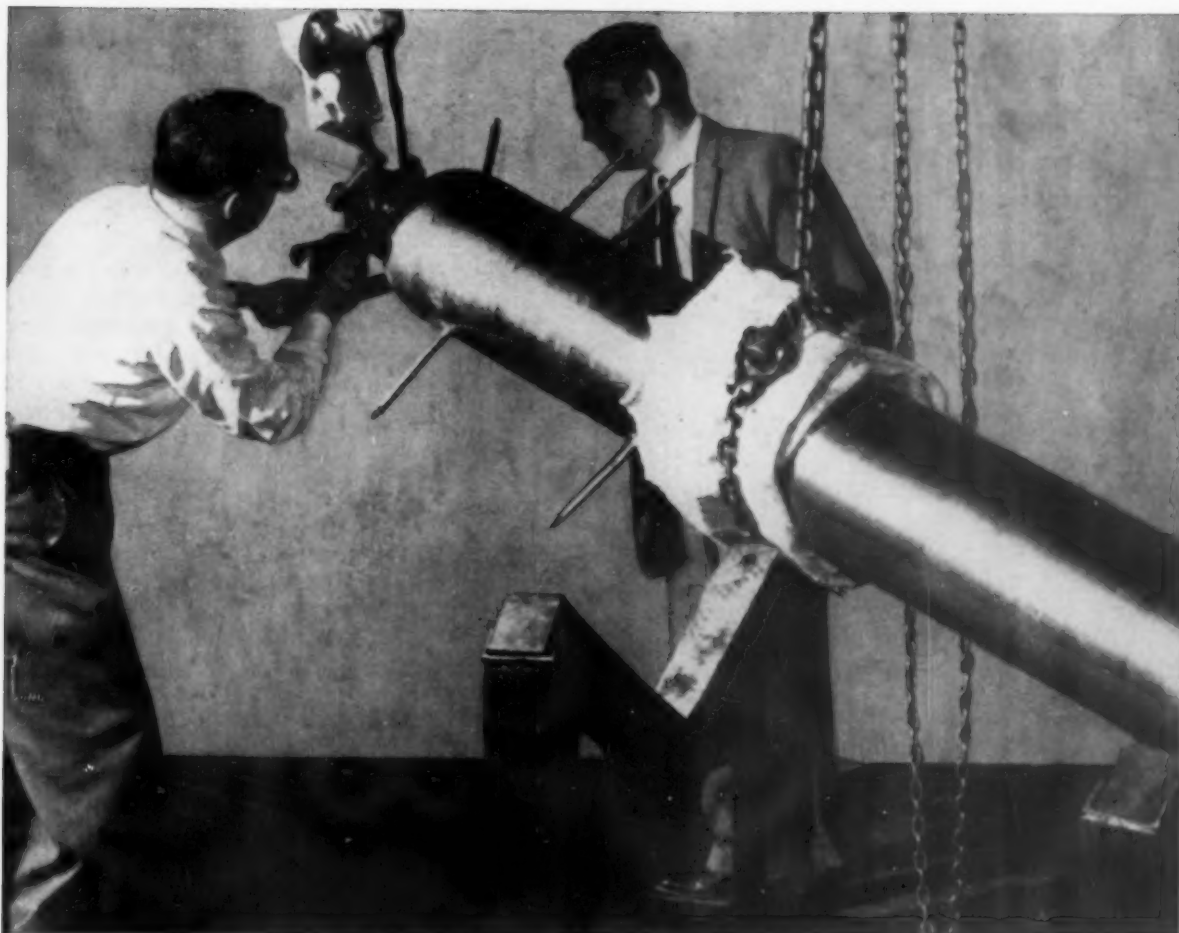
His hunch was justified: after a full year of service on a couple of clamp trucks, the coating of Dura-Grip shows no sign of wear.

"We've saved the cost of metalizing the clamps, and we've also done away with roll slippage," says Mr. Muller. "Though there was no serious hazard involved if a roll slipped from the clamps, the roll was usually damaged."

Dura-Grip is supplied by Mine Safety Appliances Company in kit form. The kit consists of the resin bonding agent, accelerator, aluminum oxide grit, and applicator. Surfaces to be coated are cleaned and given an initial application of resin, after which the abrasive is sprinkled on while the coating is still wet. After one hour's drying time, excess grit can be swept off and reclaimed.

A second coating of the bonding mix is then brushed or rolled on over the grit. The accelerator hastens hardening or curing. Edges, sides and corners of the grit particles protruding above the resin form the slip-proof surface.





Grinnell and Westinghouse engineers hydrostatically test piping for Westinghouse nuclear reactors

## Grinnell prefabricated pressure vessels maintain environmental conditions in Westinghouse test loops

This torpedo-shaped vessel, which is made of centrifugally cast stainless steel pipe, will play a vital role during nuclear research reactor experiments at Westinghouse. Its job — maintaining the desired pressure in a high temperature, high pressure in-pile test loop.

These in-pile loops required the exacting fabrication skills and equipment available in Grinnell's extensive shop facilities. Shop test equipment and procedures assured conformance to tolerances several times more critical than normally necessary.

Grinnell assumed sole responsibility for safe delivery of finished components. Specifications included accurate machining, argon shielded welding, selection of welding rod and flux materials for smooth interior weld surfaces, step-by-step inspection — even complete radiography of centrifugally cast stainless steel pipe.

Whatever your field, you'll find Grinnell shop-fabrication greatly reduces costs of cutting, fitting, welding, assembling and final erection. You are assured of adequate

facilities for producing pieces of any size, at costs known *before* you start. What's more, you get the advantages of *one-company responsibility*.

Consult Grinnell on your next piping installation. Grinnell Company, Inc., Providence 1, Rhode Island.



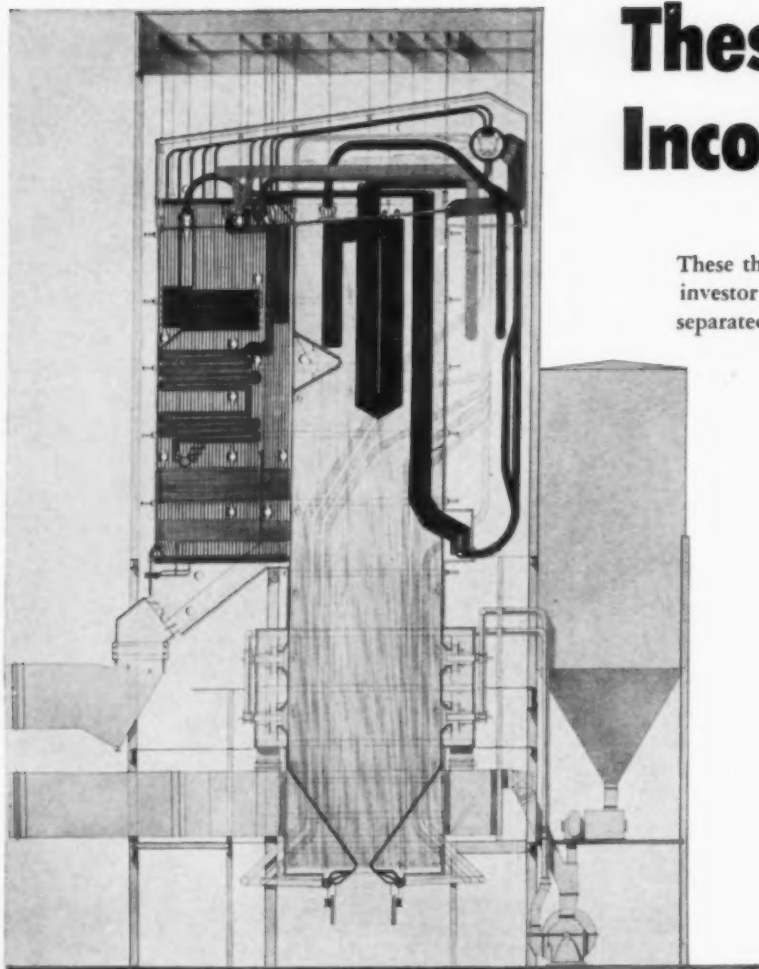
Grinnell shop-fabrication assures conformance to tolerances several times more critical than normally necessary.

# GRINNELL

Pipe Fittings, Prefabricated Piping, Piping Specialties  
and Engineered Pipe Hangers  
Branch Warehouses from Coast to Coast

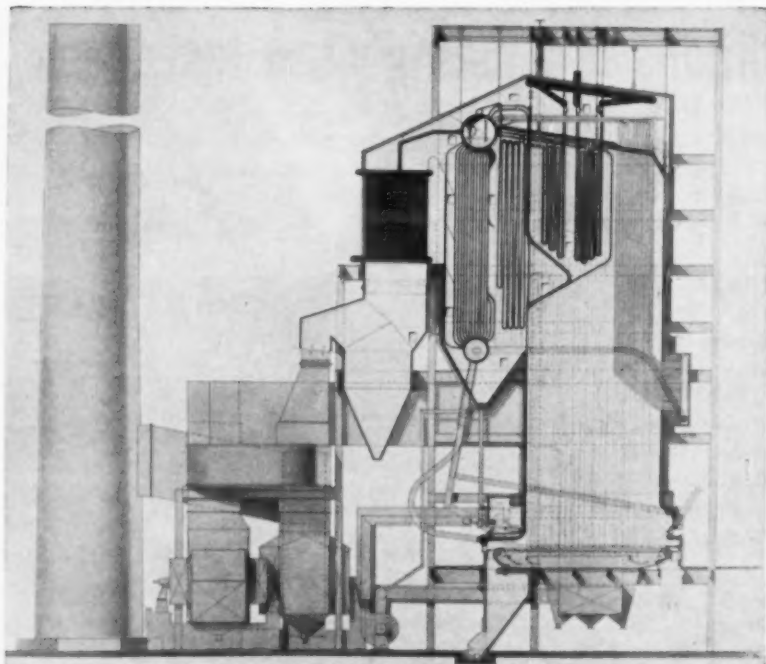
# These RILEY Incorporate The

These three Riley boilers are being built for three investor owned electric utilities in three widely separated sections of the country. Featured in these designs are some of the most recent Riley engineering developments, such as the Riley *Turbo Furnace*, new superheater and reheater arrangements, new high capacity steam washer, use of radiant superheater platens, multiple downcomers for uniform distribution of feedwater, opposed wall firing, new '60 type Riley Flare Type Burners and Pulverizers, and the world's largest spreader stoker.



## Left— For A Central Station — Southeast

This dry bottom balanced draft pulverized coal fired unit is a 1,700,000 lbs/hr unit, 2525 psi at superheater outlet, 1005F superheat and 1005F reheat. The unit is fired by five No. 550E Riley Pulverizers and twenty Riley Flare Type Burners with two rows of five burners in the front and rear walls. This boiler will be completely automated.



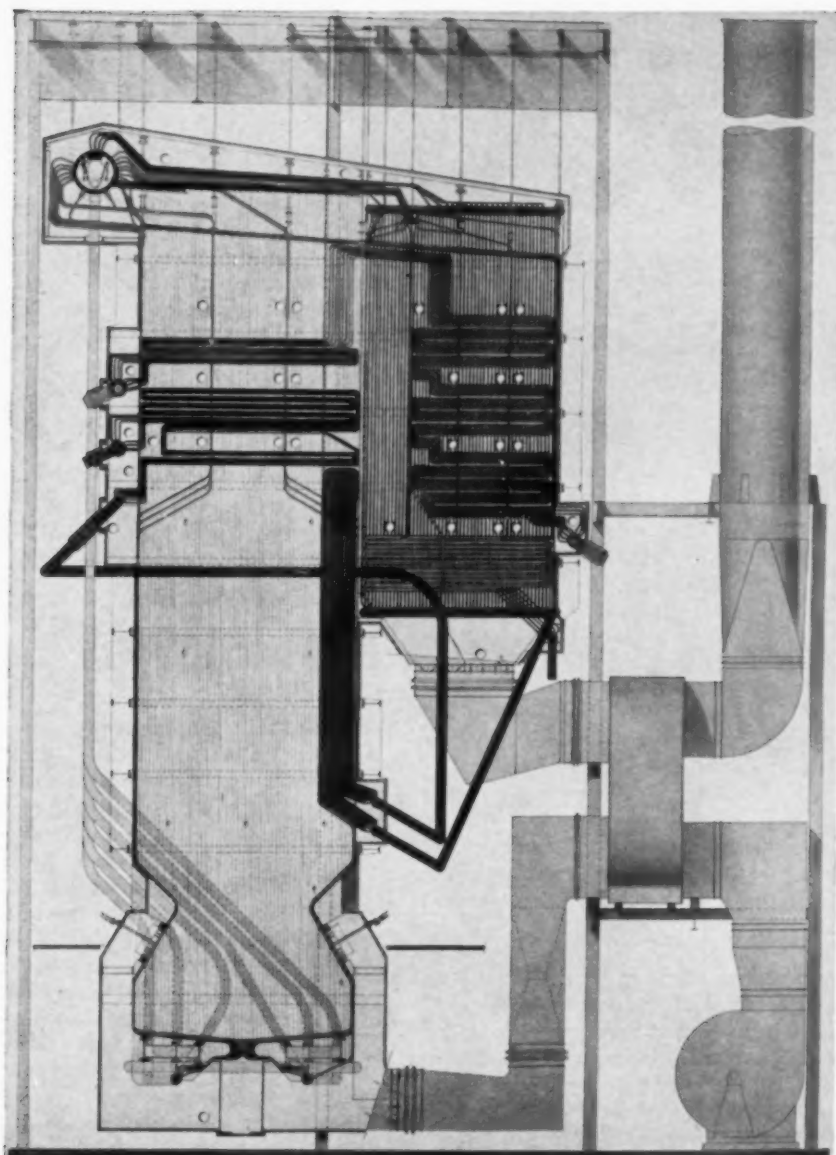
## Opposite Page — For A Central Station — Southwest

This is a gas fired Turbo Furnace Unit having a normal capacity of 2,486,000 lbs/hr, 2425 psi, and a peak capacity of 2,668,000 lbs/hr at 2590 psi superheater outlet pressure, 1005F superheat and 1005F reheat. It is designed for pressurized operation without induced draft fans, and for future pulverized coal firing with merely the addition of water tube platens.

## Left— For A Central Station — Northwest

This unit will be by far the largest spreader stoker fired lignite burning boiler. The Riley Traveling Grate Spreader Stoker is 38'-0" wide by 27'-0" shaft centers. The boiler is designed for a continuous capacity of 650,000 lbs/hr, 1300 psi, superheater outlet 955F, and a peak capacity of 685,000 lbs/hr. It will burn 6680 Btu. North Dakota lignite. Among the reasons for selection of spreader stoker firing of lignite were the large savings in power and maintenance over pulverized coal firing.

# Central Station Boiler Designs Latest Riley Engineering Features



## Some Electric Utility Riley Customers

Arizona Public Service Co.  
 Carolina Power & Light Co.\*  
 Central Power & Light Co., Texas  
 Kansas Gas & Electric Co.  
 Holyoke Water Power Co.\*  
 Minnesota Power & Light Co.\*  
 Eastern Iowa Light & Power Co.  
 Philadelphia Electric Co.\*  
 Louisiana Power & Light Co.\*  
 Texas Electric Service Co.\*  
 Public Service Company of Indiana, Inc.\*  
 Arkansas Power & Light Co.  
 Utah Power & Light Co.\*  
 Columbus & Southern Ohio Electric Co.\*  
 Central Illinois Light Co.\*  
 Houston Lighting & Power Co.\*  
 South Carolina Electric & Gas Co.\*  
 Union Electric Co., Missouri\*  
 Southern Nevada Power Co.  
 Commonwealth Edison Co.  
 Florida Power Corporation\*  
 Dallas Power & Light Co.\*  
 Monongahela Power Co., —  
 The Potomac Edison Co.\*  
 Delaware Power & Light Co.  
 Southwestern Gas & Electric Co.  
 Northern States Power Co.  
 Central Louisiana Electric Co.\*  
 Gulf Power Co.\*  
 Pennsylvania Electric Co.  
 Iowa Electric Light & Power Co.\*  
 Montana-Dakota Utilities Co.\*  
 Mississippi Power Co.\*  
 Ohio Edison Co.\*  
 Iowa Public Service Co.\*  
 Interstate Power Co.\*  
 Pacific Gas & Electric Co.  
 Southern Indiana Gas & Electric Co.  
 Upper Peninsula Power Co.  
 New Orleans Public Service Inc.\*  
 Northern Virginia Power Co.  
 Iowa-Illinois Gas & Electric Co.\*  
 West Penn Power Co.  
 Upper Michigan Power & Light Co.\*  
 Superior Water, Light & Power Co.  
 The Cliffs Power & Light Co.  
 Otter Tail Power Co.\*  
 North Dakota Power & Light Co.  
 The Hartford Electric Light Co.  
 Worcester County Electric Co.

\*Have placed repeat orders.

*A careful survey of your plant  
by a qualified consulting engineer  
could show ways of making sub-  
stantial savings in power costs.*



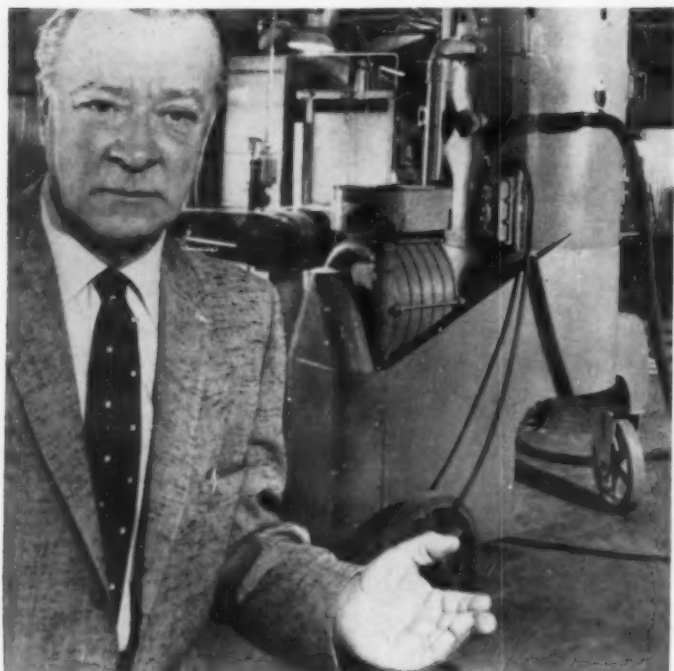
# RILEY

STEAM GENERATING & FUEL BURNING EQUIPMENT

For Complete Details About Riley Boilers Write RILEY STOKER CORPORATION, WORCESTER, MASSACHUSETTS

Sales Offices: Boston, Charlotte, Chicago, Cincinnati, Cleveland, Denver, Detroit, Honolulu, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, St. Louis, St. Paul, Seattle, Syracuse.

## Case 29 — Safety Improved in Texas Plant



Mr. William Boustead, vice-president of Arlington, Texas Industries is shown describing the use of the Wetco-Vac in the foundry section of the plant.

## Vacuum System for Magnesium

**THE NEED FOR PROPER** safety precautions and the results obtained from use of a properly designed wet vacuum system for dust and chip collection are illustrated by the case history of Arlington, Texas Industries, Inc., producers of magnesium and aluminum castings.

After a disastrous magnesium dust fire which spread the entire length of their building in less than 30 seconds and caused more than \$100,000 loss, the company purchased a 5 hp Wetco-Vac portable vacuum cleaner from the Air Appliance Division of Hoffman Industries.

The cleaner is employed at machines where magnesium castings are ground to a smooth finish. It is at this point where the slightest spark will set off a chain reaction

fire as one dust particle blazes to ignite the next.

Developing a suction of 6.5" Hg, the unit has sufficient capacity to operate two 1½-in. induced draft cleaning lines simultaneously. All hoses are heavy duty, rubber coated and static proof. The cleaning tools and accessories are non-ferrous to minimize the possibility of sparking. Hoses can be 25, 50, 75 or 100 ft in length. At the Arlington, Texas Industries plant, 75 ft of hose is used.

As magnesium dust is picked up in the hose, a wet type dust separator with a capacity of 50 gallons of water wets and traps the material out of the air stream. Air and entrained material pass between a series of internal baffles located above and below the water line. Mixing action insures thorough wetting of the collected material with the nonsoluble portion settling to the bottom of the tank.

Periodic removal of sludge is essential and is made through a discharge valve. There are no in-

ternal moving parts and all interior surfaces are accessible for inspection and cleaning. For complete safety, the separator is equipped with a 16-in. gravity closing combination explosion release and inspection door, an 8-in. inspection door, and an 8-in. glass porthole door as well as two 2-in. gravity closing explosion vents.

In analyzing the work of the Wetco-Vac in his plant, Mr. William Boustead, vice-president and general manager of Arlington, Texas Industries has this to say: "Installation of the Wetco-Vac led to a 25% saving in labor costs in the cleanup department, and we can put a lot more men and machines in the building than we could before. It has actually enabled us to increase our capacity by about 33%."

## Case 30 — Gulfport, Miss.

### Better Circuit Protection at Less Cost

**SOME TIME** ago, the Gulfport Ice

Co. called us in to do their electrical maintenance work. At the time, they were having a great deal of difficulty with motor starting currents causing ordinary fuses to blow. They were using 100, 200 and 400 ampere ordinary fuses to protect the motors.

These frequent outages disrupted the company's normal operation and created a costly and annoying situation. Just to replace the ordinary fuses was costing them about \$40 a month.

Our first recommendation to them was to change to Fusetron dual-element fuses in the proper size for safe motor protection. They did, and I do not recall even one 400 ampere fuse having blown since — and outages on the 100 and 200 ampere circuits have been very infrequent.

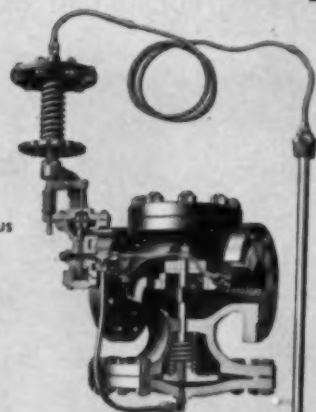
By OSCAR O'NEAL, Pres.  
O'Neal Electric Co.  
Gulfport, Mississippi



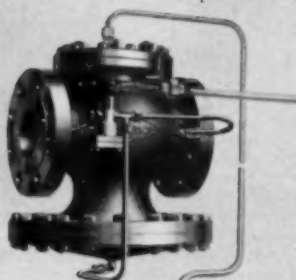
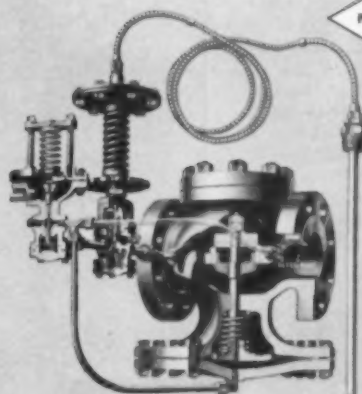
## How to Select Automatic Regulating Valves For Temperature Control

THE  
MOST  
COMPLETE LINE OF  
PRESSURE AND TEMPERATURE  
REGULATORS  
IN THE  
WORLD

1. Instantaneous Heaters  
Spence  
ET124  
Series

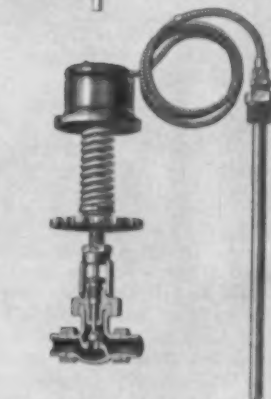
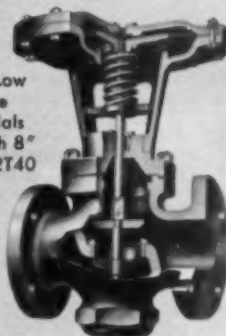


2. Storage Heaters  
Spence  
ET14D



3. Air Control Systems  
Spence  
EAT Series

4. Very Low Pressure Differentials  
2" Through 8"  
Spence G2T40



5. Very Low Pressure Differentials  
Up Through 2" Valves  
Spence Direct Acting T2

During the past year, our field representatives have reported many cases of improperly, and uneconomically, applied temperature regulators. To help you avoid some of these costly mistakes, here are a few tips on selecting the most effective and economical temperature regulating valves for your applications.

1. Instantaneous heaters require a special action for close temperature control and freedom from hunting. In the Spence ET124 series, steam pressure is modulated according to temperature (demand) and is automatically regulated at any pressure established by the demand.
2. Storage heaters, on the other hand, are more economically controlled by the Spence ET14D, which in-

cludes a simple temperature-actuated pilot that opens and closes the main valve to maintain a constant temperature.

3. Air control systems can now have a  $\pm 5^\circ\text{F}$  control accuracy under wide and instantaneous load swings with the Spence EAT regulator. Engineers report savings of up to 50% in installed costs with this recently developed Spence cascade system when it has been used in place of conventional instrumentation.
4. For the combination of very low pressure differentials and air or water control, Spence recommends Type G2T40. This single seated valve provides fast, positive response in 2" through 8" valves. Double seat Type G22 is also available in 10" through 12".

5. When very low pressure differential is encountered with valves of 2" or less, the Spence direct operated T2 is recommended. The sensitive vapor tension thermostat responds quickly to small changes in bulb temperature for continuous, accurate control.

In this brief description of industrial process and heating temperature control, we have given a few important tips in proper regulator selection. If you would like more detailed information on these control applications, write for the new Spence Temperature Control Bulletin IV 1014. 00-100

SPENCE ENGINEERING COMPANY, INC.,  
Walden 1, N. Y.  
Paulsen Spence, P. E., President

# What Really Happens Inside the Bucket

## Exploding a widespread misconception of the operation of inverted bucket steam traps

In describing the operation of the inverted bucket trap many well meaning people—and some not so well meaning; i.e., competitors—refer to the need for a “bucket full of steam” to close the trap, and a “bucket full of condensate” to open the trap. The implications of these requirements are many. Sometimes they are contradictory. Often they are misleading. Observations of a trap with a glass body and a glass bucket plus trap design considerations tell the true story.

In a well designed inverted bucket trap (Armstrong, naturally) the bucket will float and close the valve when it is no more than two-thirds full of steam. For example, the bucket in an Armstrong No. 812 trap is 3<sup>1</sup>/<sub>16</sub>” deep. It will float with only 2” of steam.

Good design also dictates that the maximum test opening pressure of a trap should be well in excess of the maximum working pressure for which the trap is furnished. For example a No. 812 trap for 100 psi with the bucket filled with cold water should open at a test pressure of at least 165 psi. Therefore, the bucket does not have to fill completely with condensate to open at 100 psi. The entrance of 1.20” of condensate will cause the bucket to sink. .8” of steam remains at the top of the bucket at the time it is heavy enough to open the valve at 100 psig and with no back pressure.

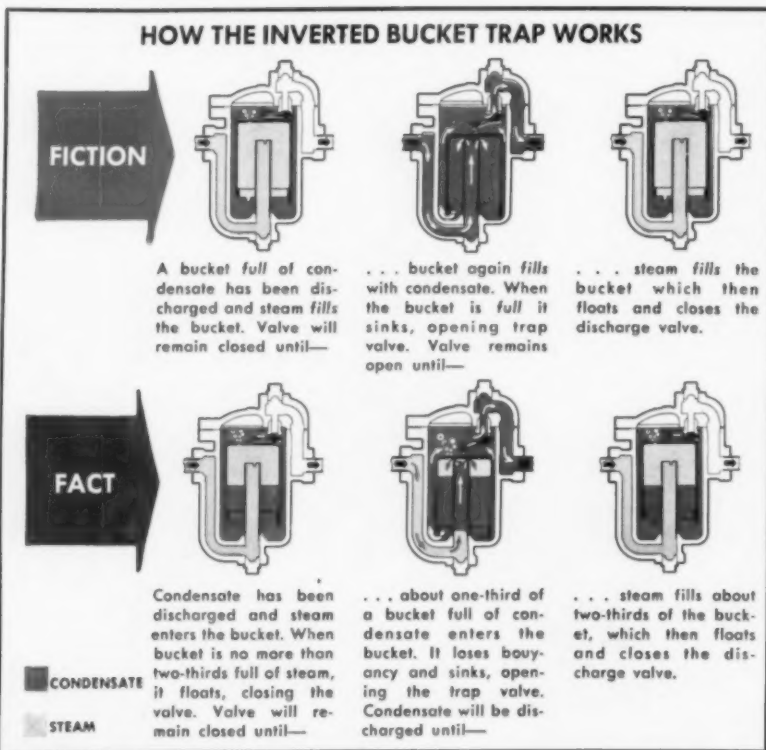
Thus the opening and closing of a 100 psi trap with 3<sup>1</sup>/<sub>16</sub>” deep bucket is controlled by a change in the water level of only 1.20”.

In actual practice the 100 psi trap may be draining a steam main in which daytime pressure is only 30 psig. Instead of requiring a 1.20” rise in bucket water level to open the trap against this pressure, the bucket will be heavy enough to open the valve as soon as the water level in the bucket has risen about <sup>3</sup>/<sub>16</sub>”.

Obviously, it does not “take a bucket full of steam” to close the inverted bucket trap, or a “bucket full of condensate” to open the trap.

### What's the Significance?

As illustrated above the opening of an Armstrong Trap requires the accumulation in the trap of less than one-third of a bucket full of condensate. This assures good operating characteristics for the vast majority of services by discharging small accumulations of condensate as soon as they reach the trap. It also assures



frequent opening pressure drops to break up air and condensate films on heat transfer surfaces and thereby maintain high heat transfer rates in the unit being drained.

Additionally, the fact that no more than two-thirds of a bucket of steam is required to float the bucket means that there will always be a generous water seal at the bottom of the bucket. In the case of the No. 812 trap described above, it will be 1.8” deep. This insures that no steam can leak from the bottom of the bucket. More importantly, the bucket can float to close the valve even when the bucket is not completely submerged in condensate.

### A Proven Principle Engineered Up to the Minute

While the inverted bucket concept for steam traps is half a century old, today's Armstrong inverted bucket traps incorporate design considerations unknown 50 years ago. The inverted bucket of the Armstrong trap, for example, is not just an upside down bucket. It is a carefully sized, weighted and vented component of a steam trap mechanism that experience proves will do its job right. Throughout, Armstrong design has

kept pace with technological advancements, modified when necessary to meet changing requirements.

We do not claim that Armstrong Traps will do every single job better than any other trap. But we do believe it will do more jobs better and more consistently than any other trap. More important, though, for most services, Armstrong Inverted Bucket Steam Traps enable you to get more efficient steam utilization with minimum problems.

We're so sure of what Armstrong Traps can do that we unconditionally guarantee that they will satisfy you. You are the sole judge, too, so there's practically no risk.

\* \* \*

The 48 page Armstrong Steam Trap Book describes other Armstrong features. It also discusses trap selection, installation and maintenance. Ask your Armstrong Representative for a copy or write: **Armstrong Machine Works, 8062 Maple Street, Three Rivers, Michigan.**



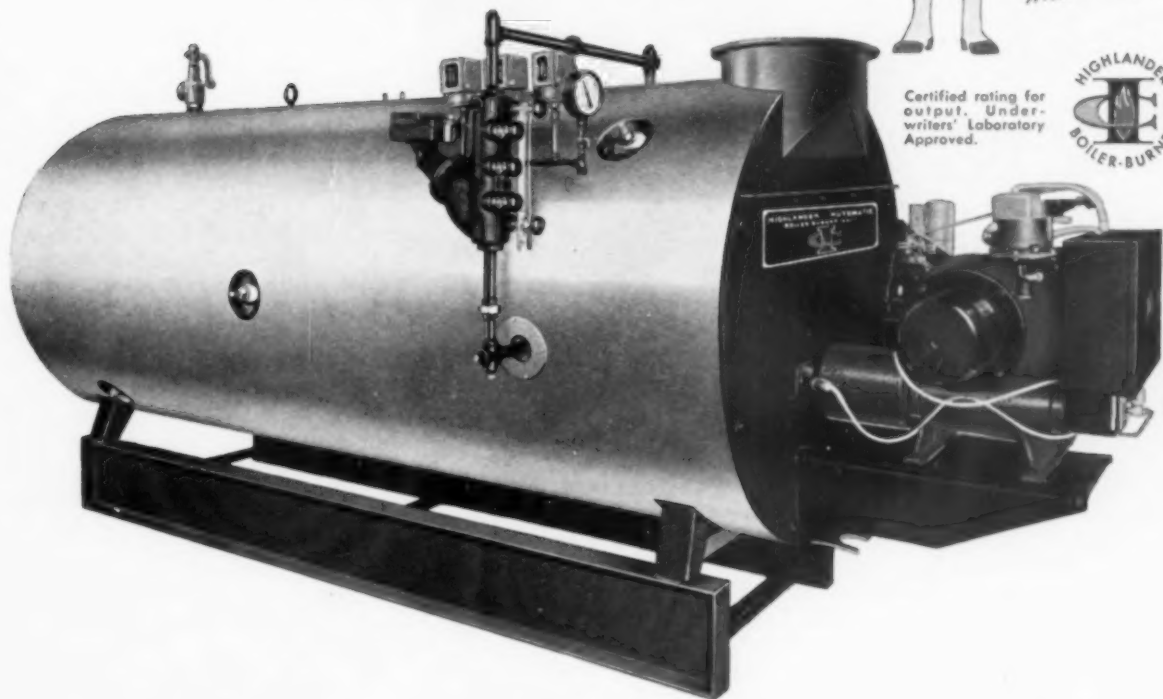
**ARMSTRONG  
STEAM TRAPS**

# NEW HIGHLANDER

COMPLETELY AUTOMATIC  
BOILER-BURNER UNIT



Certified rating for  
output. Under-  
writers' Laboratory  
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**YOUR CHOICE OF HEV-E-OIL,  
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HEART OF THE HIGHLANDER is the famous Industrial Combustion Burner. The HEV-E-OIL Burner engineered to use inexpensive No. 4, 5 and 6 heavy oils is shown here. Available from 5 to 150 gph. HEV-E-DUTY Power Gas Burners and Combination gas/oil Burners from 720,000 to 21,000,000 BTU.

Write Dept. K-101 for complete information.

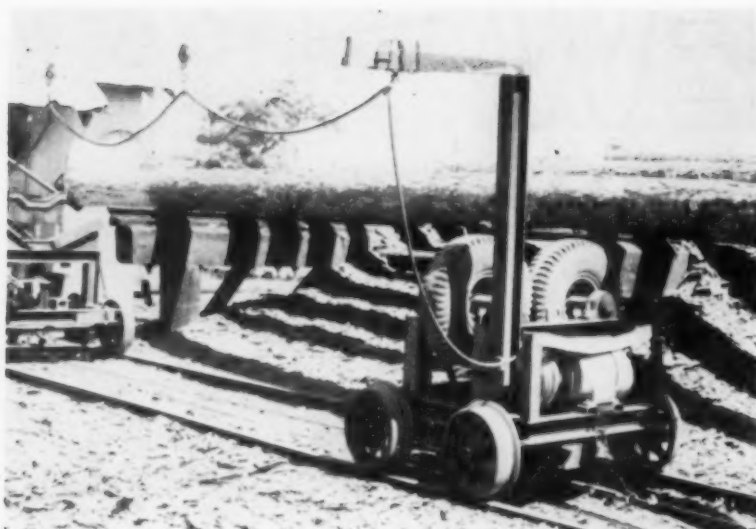
## PROVEN ECONOMY

**SAVES ON INSTALLATION.** The new Highlander is a completely assembled boiler-burner plant. Installing one simple unit saves money. Designed by Engineers with years of experience in matching burners and boilers for the exact job — whether it is power, processing or heating. No problem of taking a boiler and trying to match a burner to it. The Highlander Boiler-Burner unit is design-controlled at the factory for maximum reliability.

**SAVES ON OPERATION.** Designed to get maximum economy from available fuels. The Highlander is built for low pressure or high pressure steam or hot water — Industrial Combustion burner furnished for a heavy oil, light oil or combination of gas/light or gas/heavy oil. Simple! Just 2 flue passes. Easy Maintenance! Boiler interior easily accessible. Reliable! Each burner is completely fire tested at the factory.

**INDUSTRIAL**  **COMBUSTION**  
**INC.**

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Case 31 — Pensacola Creosoting Plant

## Creosoting Plant Saves Labor

PENSACOLA Creosoting Division of American Creosote Works, Inc. has been supplying creosote impregnated telephone and power poles and fence posts for more than forty years. There have been no significant changes in the treating process during the past decade.

Briefly, the long and short leaf pine poles are peeled, steamed, put under a vacuum to remove as much moisture as possible, and then immersed in heated creosote under pressure.

To insure a good product, peeling of the bark must be uniform and thorough. Years ago this operation was performed by hand. Mechanical peeling machines were then developed. Most of these consist of two rotating planer heads mounted on movable arms positioned at right angles to the pole. The axes of the cutters are angularly displaced from the axis of the pole which is rotated and driven through them by a pair of angularly mounted rubber-tired feed rolls. These peelers are manually fed.

The pole is rolled off the loading ramp onto a pair of dollies riding on rails, whereupon two men push the pole into the peeling machine feed rolls. A third man stands by with a peavey to help the feed rolls

start the pole rotating.

At the discharge side another man is ready with an adze to clean off any bark that might be left by the cutters. As the peeled pole emerges it drops onto two more dollies and is pushed to the unloading section.

Recently, in connection with the installation of a second peeling unit, Pensacola Creosoting developed a mechanical feeding arrangement which is largely responsible for eliminating four men from the operation. The poles are loaded on the dollies as before. But, by means of a unique cable and sheave system, they are moved into the peeling machine under power.

Another improvement incorporated is the use of a set of drive rolls on one of the dollies. These rolls, similar to those in the peeling machine, are mounted with their axes parallel to the pole and serve to have the pole rotating as it enters the peeling machine drive rolls. Consequently, men to push the dollies and to start the pole into the peeler are no longer needed.

Since better designed cutting heads were included in the new peeling unit the clean-up man at the discharge side also became unnecessary.

The bark from the poles is used

as fuel for the generation of process steam; the boilers being hand fired. Future plans include the possibility of a new furnace design, mechanical fuel conveyors, and stokers in the interest of improving combustion efficiency and reducing the amount of boiler room personnel.

By R. C. ROETGER  
Warrington, Fla.

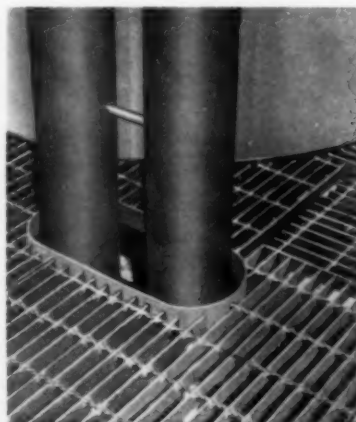
### Case 32 — Oklahoma

## Easy Access to Utility Areas

THE NEW SKELLY Oil Company building at 15th and Boulder in downtown Tulsa, Oklahoma, is one of the most attractive, modern and complete office buildings in the Southwest. It serves as headquarters for all phases of the company's widespread petroleum activities.

In addition to its beauty, the latest in modern, functional equipment is installed inside. Utility service was provided with easy access in mind.

Kerrigan Weldforged grating was chosen for the pipe and boiler stack platforms throughout the building. Its open area provides light and ventilation and the lightweight, pre-cut panels are easy to lift out and replace in position. The grating also provides extra safe footing for workmen, as the twisted spiral cross bars alternate, first to the right, then to the left, and are continuous across the panel, even at weld points.





# More power to your elbow

Wherever power is needed the 'ENGLISH ELECTRIC' Group are there creating new and more efficient means to generate, distribute and use it. Every 'ENGLISH ELECTRIC' job is backed by world-wide technical achievement, advanced research and manufacturing experience in five continents.

Amongst the activities of the 'ENGLISH ELECTRIC' Group are the design and manufacture of: equipment for complete electricity supply systems employing steam, oil, water, gas, or atomic power for generation; electric and diesel-electric locomotives and equipment for railway electrification; marine propulsion and auxiliary plant; aero engines, aeronautical research and testing plant, and aircraft equipment; all classes of industrial electrical equipment and complete electrifications; domestic electrical appliances; industrial electronic, radio, radar, and television apparatus, and electronic data processing equipment; meters, relays and instruments.



The Sir Adam Beck-Niagara Pumping-Generating Station in Canada incorporates six 'ENGLISH ELECTRIC' Deriaz variable pitch reversible pump/turbines. Each is rated at 45,500 h.p. as a turbine under 83 ft. head, and will discharge as a pump 4,000 to 5,000 cubic feet per second under heads from 59 to 90 ft. The pump/turbines, of a new basic design developed by 'ENGLISH ELECTRIC' in England, were supplied to the Hydro-Electric Power Commission of Ontario by English Electric Canada, a division of John Inglis Co. Ltd., and manufactured at Toronto. This illustration shows a runner hub assembly at the John Inglis plant.



On the 45-in. Universal Slabbing Mill at the Abbey Works of The Steel Company of Wales, the ingots are transferred from soaking pits to the mill by means of electrically driven rail cars. The drives and remote control scheme were engineered and supplied by 'ENGLISH ELECTRIC'. With the aid of fifteen television cameras and monitors in a closed circuit system, designed and installed by Marconi's Wireless Telegraph Co. Ltd., the operator is able to follow every stage of the operation and to control the vehicles with speed and accuracy.

The 'ENGLISH ELECTRIC' Deltic locomotive, powered by two 1,650 h.p. Napier Deltic diesel engines is the most powerful single-unit diesel-electric locomotive in the world. Twenty-two of these 3,300 h.p. locomotives are being built by Vulcan Foundry for British Railways.



## The 'ENGLISH ELECTRIC' Group

Enquiries to: THE ENGLISH ELECTRIC CORPORATION • 750 THIRD AVENUE • NEW YORK • N.Y. Telephone: Murray Hill 7.0303

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OC/U III



## Well Aimed Light for Work Area

### Case 33 — North Carolina Industrial Plant

This receiving dock and storage area of a North Carolina industrial plant is brilliantly illuminated for after-dark materials handling by General Electric L-83 Floodlights. Two towers each hold three of the powerful floods, with an aiming pattern designed to provide uniform illumination of the work area.

### Case 34 — Georgia Lumber Company

## Fire Hazard Changed to Profit

### THE WILLIAMS BROS. Lumber

Co. of Atlanta, Ga., had a shavings pile approximately fifty feet in diameter and forty feet high. They were ordered by the city fire marshal to cease blowing their shavings to the pile. City regulations would not allow them to install an incinerator, and they had to have the shavings and sawdust hauled away, which was rather expensive.

The Warren Company's plant, which was approximately 1,500 ft away, did not have sufficient shavings from its own operation to furnish fuel for its boilers, and consumed a large amount of coal. The company came up with the idea that they could make use of their neighbor's waste.

The writer was at that time vice-president in charge of the blow pipe department of the Southern Blow Pipe and Roofing Co. of Chattanooga, Tenn., and had done practically all of the Warren Company's blow pipe work. Consequently, he was called in to help solve the problem.

After making a survey of the situation, we reached a solution through the Williams Bros. Lumber Co. blowing the shavings to a dust collector located over a bin approximately 450 feet from their

mill. A chain conveyor was installed in the bottom of this bin, to drag the shavings at an even feed to the inlet of a relay fan driven by a 75 hp motor, which delivered them to the shavings house of the Warren Company.

The pipe line inside of the house was arranged so that the shavings could be spread over the house, or

delivered to a dust collector that dropped them into automatic stokers. For night firing, another fan was installed to suck the shavings from the storage bin and deliver them to stokers.

This operation not only did away with the fire hazard at the Williams Bros. plant, but saved them expense of moving the shavings; and it saved the Warren Company thousands of dollars each year in fuel bills.

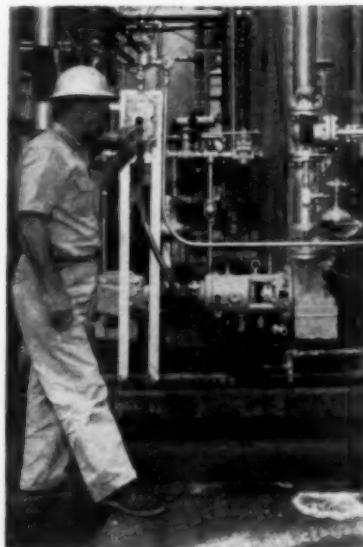
By LEE L. RYERSON  
St. Petersburg, Fla.

### Case 35 — Louisiana

## Sealed for 8½ Years

**PUMPING** gasoline stabilizer at a temperature of 320 F, and pressure of 300 psig, the Bel Oil Company, Elton, Louisiana, has chalked up a record of 8½ years of almost continuous day and night service — without any kind of maintenance on this Type U Borg-Warner Mechanical Seal.

When finally taken down after this record run, only the gaskets and seal faces were replaced, and the old faces were re-lapped and returned for use as spares.



# AIR APPLIANCE DIVISION

# HOFFMAN

INDUSTRIES, INC.

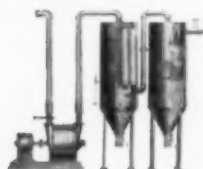
A SUBSIDIARY OF HOFFMAN INTERNATIONAL  
103 FOURTH AVENUE • NEW YORK 3, NEW YORK • PHONE OREGON 7-3600

Designers and manufacturers of cast iron multistage centrifugal air blowers/exhausters—gas boosters—Hoffco-Vac portable and stationary industrial vacuum cleaning systems—Hoffco-Veyor pneumatic conveying equipment—cyclone separators and bag type dust collectors—Smooth-Flow pneumatic tubing and fittings—continuous metal, rubber, glass and plastic strip/sheet dryers—can and bottle blow-off systems—steam and gas operated air heaters—hose and tools—valves and accessories.



## MULTISTAGE CENTRIFUGAL BLOWERS & EXHAUSTERS

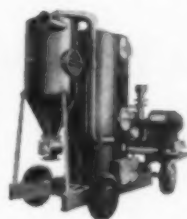
Rugged cast iron Hoffman blowers deliver clean dry air or gas in continuous duty applications such as combustion, agitation, drying, vacuum cleaning, sewage and waste treatment, pneumatic conveying, air squeegee, ore flotation, circulation of liquids, asphalt blowing, etc. Pressures to 10 psig, vacuums to 12" hg, and volumes to 20,000 cfm. Outboard mounted bearings. One piece cast aluminum impellers. Dynamically balanced rotors. No internal wearing parts. Vibration free operation. Constant pressure or vacuum throughout capacity range. Suitable for direct drive by motor, turbine or engine. Common steel baseplate.



## STATIONARY VACUUM CLEANING SYSTEMS

Permanently installed stationary vacuum systems ranging from 3 hp to 100 hp permit cleaning operations throughout the plant with collection at a central location.

These systems will help prevent product contamination, insure better housekeeping, salvage valuable materials, eliminate manual handling and disposal. Heavy duty dust separators receive material and large filter cloth areas insure thorough separation. Suction hoses are inserted into strategically located inlet valves in piping system.



## PNEUMATIC CONVEYING EQUIPMENT

Hoffco-Veyor pneumatic systems keep dry, powdery and granular materials on the flow. Permanent installations transfer a variety of materials including chemical powders, starch, plastic pellets, pharmaceuticals, etc., from one point to another in the production process. Rugged portable

Hoffco-Veyors such as this trailer mounted unit, can be used to handle catalyst, clay, sand, etc., in refineries, brick plants and chemical installations.

## PORTABLE VACUUM CLEANING UNITS

Maximum efficiency in industrial housekeeping can be achieved with Hoffman heavy duty portable vacuum cleaners which range from 1½ hp through 15 hp. Mobility and flexibility enables the operator to do an efficient and thorough job of vacuum cleaning anywhere in the plant. Typical of the Hoffman portable units is the 7½ hp Hoffco-Vac 75 developing 7.8" hg suction and capable of operating two hose lines simultaneously. Filtering area 48 sq. ft. Removable dust bucket with capacity of 7.5 cu. ft.



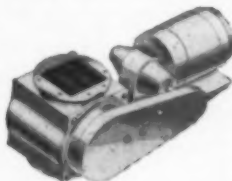
## MATERIAL INTAKE VALVE

Unique feeding valves permit the introduction of dry free flowing materials into vacuum conveying systems. Design incorporates offset air and material entry ports making it possible to regulate material flow and yet allow air to enter the line for purging. Separate air inlet protects connected equipment from full suction of the system. Constructed of cast iron, stainless steel or bronze. Valves can be modified for air cylinder operation.



## PERISTALTIC VALVE

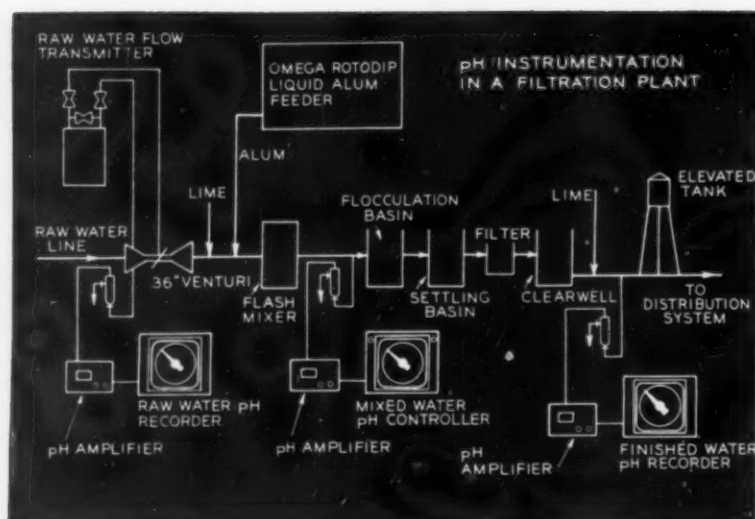
Rubber diaphragm valve utilizes peristaltic action to discharge materials in controlled quantities. Designed to handle the type of product which can not be successfully passed through a rotary feeder. Alternate opening and closing of sheet rubber diaphragms facilitate passage of coarse abrasives or odd shaped materials. Elliptical body section and sandwiching of diaphragms insures positive closure against high differential pressures. Fail-safe feature provided in event of rupture of either diaphragm.



## ROTARY DISCHARGE VALVE

These chain-driven air-locks of cast semi-steel construction discharge materials from pneumatic systems. Valves have torque limiting drive sprockets to protect against jamming and overloading. Equalizing connections permit attachment of bleed lines to vacuum or pressure source. Inspection of interior can be made through access port without disassembling valve. Fabricated and cast multi-bladed rotors are designed for interchangeability. Standard horizontal shaft gear motors.

Write for illustrated catalogues. Our application engineers are available for a survey of your production and maintenance problems without obligation.



### Case 36 — Southern Municipality

## Automatic Alum Feeder Provides pH Control

**A LARGE MUNICIPAL** water filtration plant in the South recently solved a difficult pH control problem with an interesting automatic control system, utilizing both flow telemetering and standard pH control mechanisms.

The raw water supply of the filtration plant varied widely both in pH and in flow rate as it was pumped into the plant. Accurate control of pH was necessary to achieve efficient flocculation, but the two variables made manual control difficult. The problem was solved by a dual control system which took into account both variables.

The plant installed 2 Rotodip automatic feeders for dispensing alum solution into the raw water just before it enters the flash mixer. The feeder is made up of a series of buckets or dippers on a wheel which rotates in such a way that the dippers scoop up the alum from a storage reservoir. The alum then flows away from the wheel into a small reservoir and then into the raw water line.

Automatic control of this feeder with respect to flow is initiated by a Metameter flow rate telemeter transmitter located at a venturi in

the flow line. The flow measurement taken here is transmitted to a time-duration or impulse-type controller-receiver at the feeder, which regulates a belt-shifting device between the feeder drive motor and the dipper wheel.

This controller starts and stops the rotation of the dipper wheel on a controlled proportional basis. At "no flow," the dipper wheel is at

rest. At 50% flow, the wheel rotates half the time. At full flow, the wheel rotates all the time. In this way, alum is introduced to the water at a rate proportional to the flow rate.

In addition, a Dynamaster pH recorder-controller with adjustable proportional band and automatic reset is used. Electrodes are installed just downstream from the flash mixer. When a change in pH of the water occurs, the pneumatic controller actuates a piston which controls the speed of the dipper wheel rotation. As the pH increases, the dipper wheel rotates faster, adding more alum; as the water becomes more acidic, the speed decreases proportionally.

With the dual control methods compensating for changes in both flow rate and initial pH, the water flowing into the settling basins is held at a uniform pH for optimum flocculation and settling.

As a final check on the pH control system described, the filtration plant installed a Dynamaster pH recorder in the line supplying the distribution system from the filtration plant. A pH recorder is also installed in the raw water line ahead of any treatment, for informational purposes.

The Omega Rotodip feeder is a product of Omega Machine Company, Division of B-I-F Industries, Inc. Dynamaster pH recorder-controllers and Metameter telemeters are made by The Bristol Company.

## Better Coal Cleaning . . . . . Case 37 — Kentucky

**THE STONEGA** Coke and Coal Company is completing a new installation at its Glenbrook Mine, Harlan County, Kentucky. The new equipment will provide for jig type washing of all sizes of High Splint Seam coal from 6" to ¼" and take care of increased daily capacity.

The Stonega Coke and Coal Company, in cooperation with its sales organization, General Coal Company, plans to market a full line of precisely sized and washed domestic stoker, commercial stoker, junior egg, chunk and block sizes, which should cover practically all

requirements of retail dealers and medium sized commercial and industrial customers. The ¼" x 0 will not be washed, but loaded dry, and it is anticipated that the quality of this coal will remain approximately the same as it was prior to installing the new cleaning plant.

At Glenbrook Mine, the No. 12 High Splint seam is being worked at this time. It is expected that the No. 12 seam coal loaded through the new preparation plant will be the ultimate in consistent high quality, with sizes tailored to the most exacting needs.



# versatility...

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What ever your steam generation pumping needs there is a Pacific Pump to meet your exact requirements.

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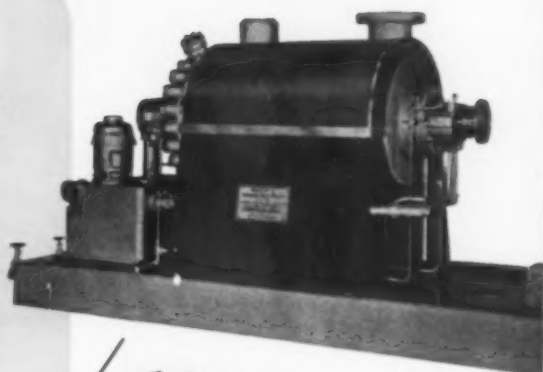
**CONDENSATE AND HEATER DRAIN SERVICE** Multi-Stage vertical pumps sized to meet all steam plant design requirements economically.

**BOOSTER SERVICE** Multi-stage vertical and horizontal pumps in a size range providing ample flexibility and capacity.

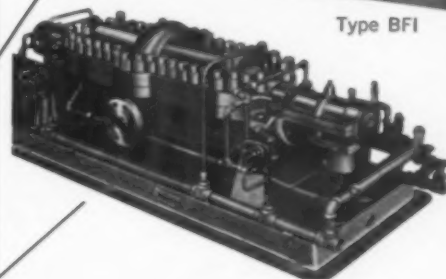
**GENERAL SERVICE** A wide selection of single and two-stage horizontal pumps for transporting small or large quantities of fluids.

Investigate the full line of Pacific centrifugal pumps for efficient, economical pumping in your steam generating plant.

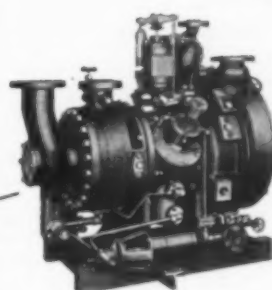
**Write for Pacific A to Z Bulletin 176**



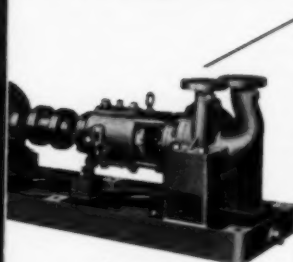
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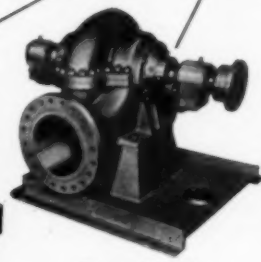
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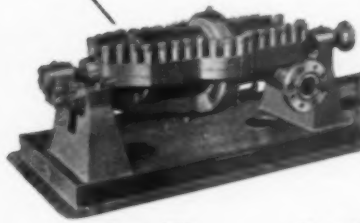
Type TBA  
(Steam Turbopump)



Type SVC



Types DS/DL



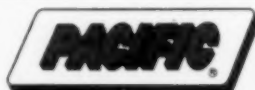
Type JTC



Type WB



Type  
WY



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HUNTINGTON PARK, CALIFORNIA, U.S.A.



### Case 38 — Sun Oil Company, Oklahoma

## "Stadium" Lighting Solves Explosion Hazard Problem

**LIGHTING** an explosion-hazard area such as a natural gasoline processing plant presents not one, but several problems — all tough ones.

Such a plant usually sprawls over a large area. There is a possibility of explosion that even the most stringent precautions can't completely eliminate. And there is always the problem of maintenance and lamp replacements.

One solution is to install a large number of low-efficiency, explosion-proof lighting fixtures. Another, and better, solution is the one reached by the Sun Oil Company when its Laverne, Oklahoma, processing plant was constructed.

They lighted the plant like a football field.

Under the supervision of Clifford Empey, of the J. F. Pritchard Company, contractor for the plant, weatherproof mercury vapor floodlights were installed around the plant perimeter, out of reach of the dangerous fumes. The basic units used were 1000-watt color-corrected mercury vapor floodlights, manufactured by the Wide-Lite Corporation, Houston, Texas. They are mounted in multiples on 50-foot steel poles. Smaller 250-watt Junior models intensify the

illumination in certain parts of the plant. The lights are on a 480-volt system, reducing the cost of transformers and permitting the use of smaller cables.

Lighting the plant from the outside has solved the explosion hazard problem. And from inside the plant proper, light flows evenly in every direction with a notable absence of shadows.

The broad, smooth coverage provided by the floodlights is achieved through the use of a patented rectangular reflector. This reflector projects a broad light pattern which can be blended with adjacent light patterns to illuminate large areas with no discernable difference in brightness. These floodlights were the first to be designed specifically to gain maximum output from the color-corrected mercury vapor lamp. On most applications, one Wide-Lite floodlight does the work of two or more incandescent floodlights of comparable wattage.

The fixtures are sturdily constructed for all-weather use. Each one has a rugged cast aluminum housing, coated with a durable finish. A tough, tempered glass lens protects the lamp from breakage, and additional protection is

provided by a patented "Stabilux" socket which grips the lamp at its upper end. This extra support protects the lamp from breakage caused by jolts or vibration.

The color-corrected mercury vapor lamp requires 61 per cent less power than incandescent lamps, and it will last from nine to twelve times longer. Lamp life is further extended by special heat dissipating fins built into the housing of the fixtures.

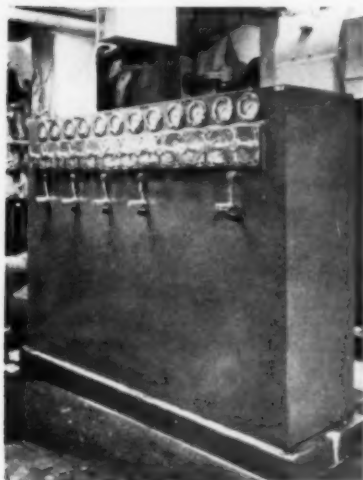
### Case 39 — Carolina Mills

## Softer Starting

**THE DEMANDS** of higher speeds

and horsepower in textile machinery in the Carolina mills, because of the newer fibers, has placed increasing loading on machinery. Automatic clutches now in wide use permit electric motors to come to full speed before applying the load, and eliminate need of over-powering for starting purposes. The Mercury Automatic Clutch, a simple inexpensive device, automatically cushions the start-up and extends the acceleration period of the machinery. It allows the electric motor to deliver its greatest torque to accelerate the machinery. Often a general purpose motor is permissible in place of a more expensive high torque type.

## Roll Control



**SCOTT PAPER COMPANY**, Mobile, Alabama, wished to supply its paper machine press sections with hydraulic loading which could be controlled accurately from a simple remote control panel.

Requirements of the system were as follows: 1—Provide constant, uniform, preset roll pressures; 2—Smooth lowering and forcing of press rolls downward to avoid damage; 3—Fast, easy, positive selection of such functions as "Lower," "Hold-Down," "Release," "Lift," "Hold-Up," and "Off"; 4—Vary pressure accurately in either end of each roll; 5—Provide visual indication of the pressure and force exerted on each end of each roll.

All of these requirements were satisfied by a system provided by The Oilgear Company.

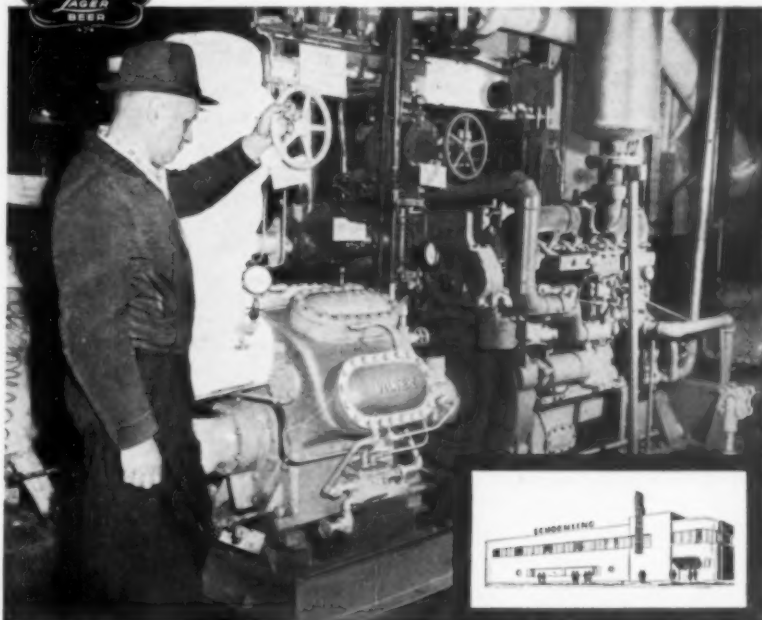
The system is powered by displacement pumps that supply fluid power to cylinders through separate valves on a remote control panel. Operating Cylinders are connected directly or through mechanical linkage to the pressure roll bearing ends.

Simplicity of the pump drive and installation keep costs to a minimum. The remote control panel provides fast, positive selection of all functions, infinitely and independently variable pressure on either end of the rolls, and direct reading of the pressure and force being exerted to permit accurate control at all times.

## Top Efficiency Brewing Schoenling with a Gas Driven Vilter Compressor



The Schoenling Brewing Co., Cincinnati, has earned a reputation for fine beer with Schoenling Cincinnati's Finest.



Mr. Raymond Winterhalter, Chief Engineer, The Schoenling Brewing Co., inspecting the gas driven Vilter VMC ammonia compressor. Inset shows exterior view of the brewery.

To most efficiently meet summer brewery refrigeration requirements, the Schoenling Brewing Co. has added a Vilter 8-cylinder VMC ammonia compressor driven by a natural gas engine to its earlier purchased electric motor driven Vilter compressors.

By switching to the natural gas engine driven compressor during the summer months, when its gas requirement for heating purposes is reduced, Schoenling is able to utilize the major portion of the gas charged for, thereby reducing electric power demand and effecting considerable savings.

The natural gas engine driven compressor is especially ideal where capacity reduction is necessary to match widely fluctuating loads. Automatic speed regulation of the power unit can be supplied so that, together with the automatic capacity control available on Vilter VMC compressors, the most economical engine speed to suit the refrigeration requirements is automatically selected and maintained.

Schoenling is well pleased with the operation of the gas driven Vilter VMC compressor, and as a result of the reliability obtained, they have been able to reduce their cost of operation.

Almost 90 years of service to the brewing industry has given Vilter the necessary experience to produce the superior refrigeration equipment used with satisfaction in hundreds of breweries throughout the world. Let our qualified engineers help you with your problems.

Sold through Vilter Distributor, C. P. Wood and Company, Cincinnati



**Vilter Manufacturing Corporation**  
Milwaukee 7, Wisconsin

Air Units • Ammonia and Freon Compressors • Booster Compressors  
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Write for Bulletin 017 to  
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2217 South First Street  
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# ONLY COLORED RUST-INHIBITIVE ALUMINUM PAINTS\*

All aluminum paints are not the same. There are different kinds.

Most aluminum paints have excellent light and heat reflecting properties. Some, in addition, are also available now in bright colors.

Subalox Anodine Finishes are like these, too, but have one outstanding difference: they are the only colored aluminum paints made in the United States with a rust-inhibitive base. They contain the exclusive Subox formula of suboxide of lead—therefore they give chemically-active protection.

Available in Azure Blue, Mist Green, Golden Beige and Bronze, Subalox Anodine Finishes are the newest color development for maintenance painting of substations, transmission towers, power plants and other equipment. These adhere to weathered galvanizing; also are compatible with other existing paints and primers.

They are easy to apply by brush, spray or roller; and because they are rust-inhibitive, only a single coat is needed to give long-life protection.

Ask for Subox Technical Bulletin No. 7 that shows colors and gives full details. Your local Subox sales engineer can supply a copy, or write direct to the factory.

\*Patent Pending

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### Case 41 — Georgia

## Seam Protectors Prolong HRT Boiler Life

A MANUFACTURING plant in Georgia was plagued with continued high maintenance costs and excessive downtime because of seam failure in its horizontal return tubular boiler.

Calking provided only a temporary cure and shutdowns became more frequent. Finally, Seam Protectors, supplied by National Boiler Protector Co., were applied to the trouble spot. These protectors, made of specially shaped refractory tiles which conform to contour of the boiler, insulate the seam from flame and radiant heat.

According to the plant's chief engineer, maintenance costs and downtime from additional fire-cracking and leakage were practically eliminated and the useful service life of the HRT boiler was greatly prolonged because of the insulating value of the seam protectors.

### Case 42 — North Carolina

## Holes in a Hurry

THE DECISION to install a three-inch pipe line through four floors of this North Carolina factory caused great concern for the Maintenance Department. The work was to be done during working hours (24-hours per day) and neither dust nor noise was permitted. This left out most of the usual methods of breaking the floors with an air hammer.

Upon consultation with their regular industrial supply salesman, the Maintenance Department decided to use the recommended Tilden Rotary Concrete Core Drill. The results were a quick run of holes, very little noise, convenient power (since a large electric drill was used), and almost complete absence of contaminating dust.

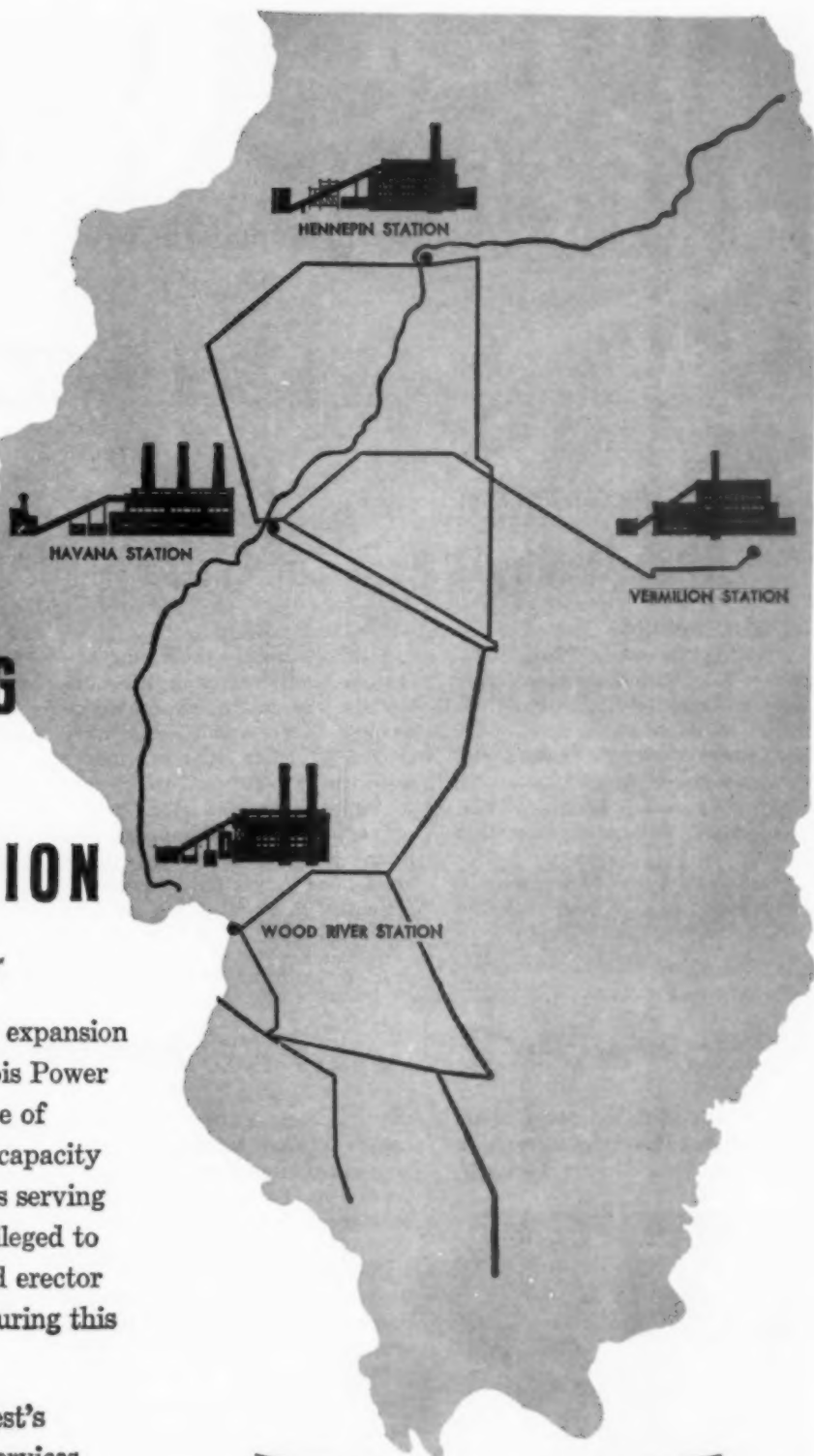


# 14 YEARS... CONTINUING PIPING CONSTRUCTION

## *for Illinois Power*

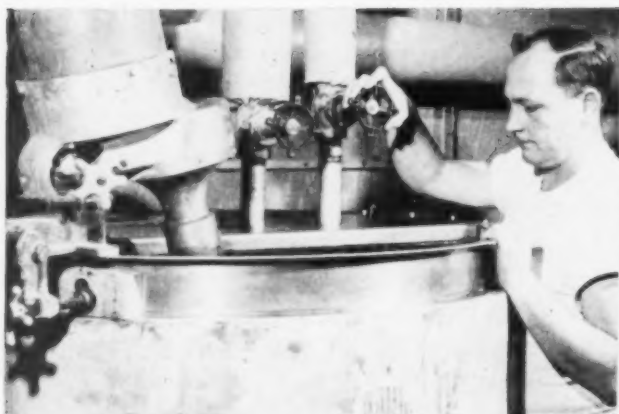
A 14-year era of extensive expansion has been enjoyed by Illinois Power Company, with an increase of 1,092,000 KW generating capacity shared by the four stations serving the state. Midwest is privileged to have been the supplier and erector of piping for all stations during this expansion program.

For information on Midwest's complete piping erection services for power stations and industrial processing plants, write today for 24-page illustrated brochure **POWER AND PROCESS PIPING.**



## MIDWEST PIPING

A Division of Crane Co. 1450 South Second St. • St. Louis 4, Missouri



Valves on starch mixing vat



Valves on mercerized washer

#### Case 43 — South Carolina Bleachery

### High Quality Valves Cut Costs

**AT THE SPRINGS** Cotton Mills Grace Bleachery Plant, Lancaster, S. C., Lunkenheimer valves were specified for the original installation. Based on the exceptional performance of these valves, the company has continued to specify Lunkenheimer or equal for the many plant expansions since that time.

Readers familiar with bleachery operations can well appreciate the need for valves that are capable of

withstanding the punishing services in this textile processing operation. Globe valves in this service are extremely vulnerable to erosion; some valve seats have eroded so badly that regrinding was required after as little as two to three weeks operation.

One of the specific applications in the Springs Plant where Lunkenheimer Valves have served excellently is the starch boiling operation. The starch is boiled

with steam pressure. Valves controlling this process must provide positive shutoff because overboiling is not only hazardous, but can easily ruin the mix.

Despite frequent throttling and continuous on-line duty, the Lunkenheimer LQ600 Bronze Globe Valves used in this service stay bottle-tight, without the necessity of seat and disc maintenance. Largely responsible for the outstanding performance is the seat and disc alloy. Patented under the name of Brinalloy, it is harder than 500 Brinell stainless steel, and actually outwears case-hardened stainless steel of 1000 Brinell.

#### Case 44 — Dallas, Texas

### Screw Conveyor Handles Meat Scraps

**MEAT SCRAPS** and large bones are handled mechanically in the Texas Meat Packers, Inc., ren-



dering plant, Dallas, by a new heavy-duty screw conveyor installation engineered and manufactured by Fort Worth Steel & Machinery Company and furnished through C. G. Unlaub Company, Dallas industrial distributor. Previously, material was handled manually, in barrels. The new system speeds handling and saves labor.

A screw conveyor, 22 inches in diameter and 30 feet long, rises at 30-degree incline from the pit into which slaughterhouse scraps are dumped from truck (see photo). Driven by a 3 hp motor at top, the conveyor feeds into a pre-grinder ("hog"). Ground to sausage-like consistency, the material drops into a second Fort Worth

screw conveyor which moves it to the cookers. This conveyor is 12 inches in diameter, 45 feet long, at 25-degree incline, and driven by a 10 hp motor.

The photograph shows scraps being dumped from 10,000-pound-capacity truck which has one compartment for suet, another for bones. The conveyor can handle the largest bones from normal slaughterhouse operations. The leveling bar (lower center) keeps material level with the conveyor trough. The conveyor has no hangers and no hold-down bars.

Plant products include cracklings, bone meal, and blood meal, used as animal feed ingredients, and oils for various uses. The plant superintendent is Mr. Wes Haney.

## Case 45 — Maryland

### Coal Flow Indicator

TO IMPROVE the reliability of handling wet and frozen coal at its Smith Station, the Potomac Edison Co. has installed a Level/Tek probe type coal hopper alarm. In the past, failure of the "No Coal Flow" alarm has resulted in operating difficulties and the temporary loss of capacity.

The Level/Tek functions as a result of a change in the electrostatic field surrounding the probe due to a change in material, such as from coal to air.

The probe is installed directly under the coal scales and parallel to the coal pipe. This location of the probe provides sufficient warning so that the "No Coal Flow" condition can be corrected without causing operating difficulties of the temporary loss of station capacity. This probe type alarm has proved very successful, and indications are that more of this type alarm will be used at Smith Station. It is manufactured by Robertshaw-Fulton Controls Company.

By RICHARD L. CRANE  
The Potomac Edison Co.  
Williamsport, Maryland

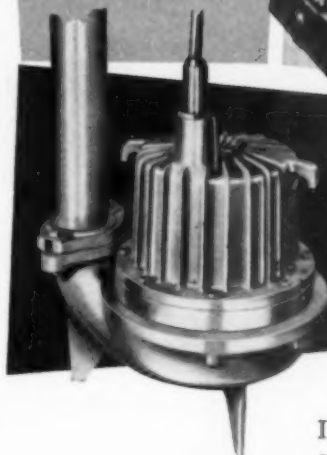
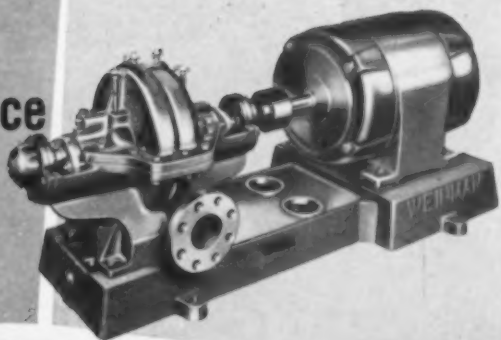
## Case 46 — Tennessee

### Better Protection Against Athlete's Foot

FROM THE standpoint of economies alone, our new foot-sprayer is a great improvement over the old sponge pad, reports Monsanto Chemical Company, Columbia, Tennessee.

As easy to use as the bathroom scale, just step on it . . . it sprays. Two atomizer sprays for each foot assure a thorough application of solution between the toes where it's most needed. It does not require daily attention and holds enough for 3,000 applications. Non-skid rubber base assures safety in shower area. Made of fiber glass and high-density polyethylene, it is sanitary and easy to keep clean. Manufactured and distributed by Onox, Inc.

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**WEINMAN  
PUMPS**

In industrial plants where efficiency and economy go hand-in-hand, you'll find Weinman Pumps on the job. And there are plenty of reasons why this is so. For example, versatile Weinman Type JC Multi-Stage Pumps have proved invaluable because of their ready adaptability to a wide range of pumping requirements. A few of the outstanding features of the Type JC Pump include precision engineering, design simplicity and quality materials that insure low maintenance, 'round-the-clock operation and a split case that makes routine maintenance easy and cuts downtime to a minimum.

And, for swift handling of sewage, drainage water and industrial wastes, nothing compares to the new Weinman Type M Immersible Non-Clog Pump. Easy to install, the Type M provides the flexibility of being a "trouble-shooting" pump for use anywhere in your shop. Whether permanently installed or portable, it gives years of maintenance-free, 24-hour-a-day service.

When you want job-proven pump performance that fits your exact requirement . . . get the advice of experience. Call your Weinman Pump Specialist today. He's in the Yellow Pages.



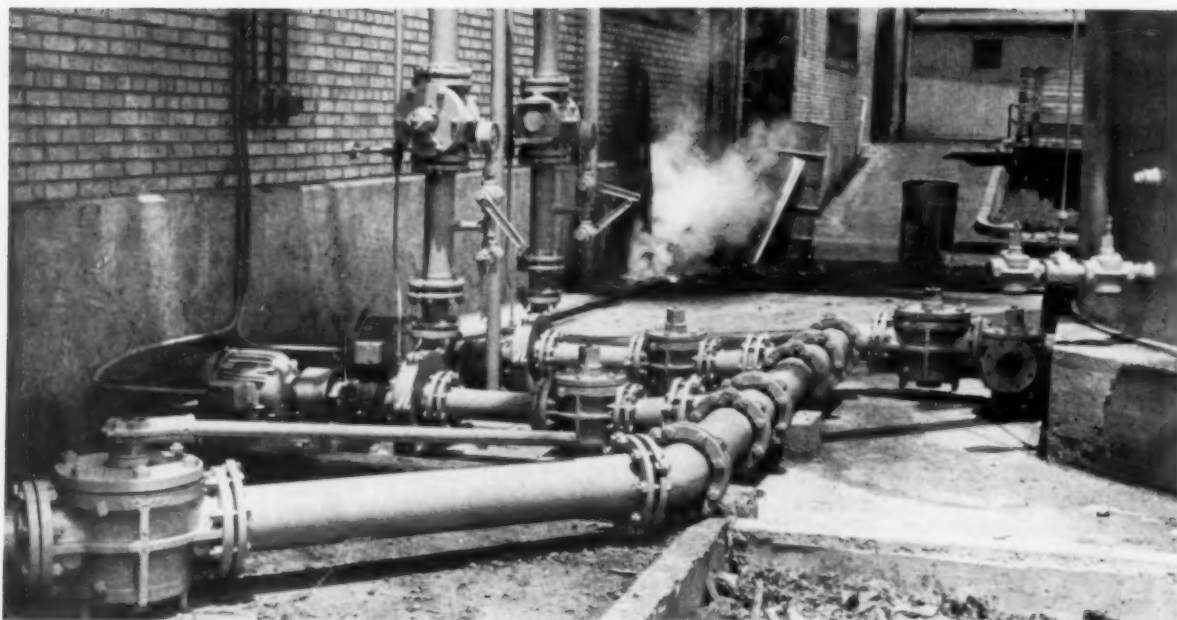
Or, write direct for  
Bulletins 1300 and 1710.



THE

**WEINMAN PUMP**  
290 SPRUCE STREET  
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CENTRIFUGAL SPECIALISTS

MFG. CO.



#### *Case 47 — Houston Synthetic Rubber Plant*

## **Plug Valves Handle Synthetic Rubber**

**THE HOUSTON** Synthetic Rubber Plant of Goodyear Tire and Rubber Company uses round port Homestead Lubricated Plug Valves to handle dilute solutions of GR-S Latex Rubber at 80 pounds pressure and 100 F temperature.

The Homestead Lubricated Plug Valves being used for this service

provide a full circular opening through the plug and body, the same size as the pipe they serve. This means that there is no place for deposits to lodge and build up in the line.

Another important feature of the valves is: they protect against contamination of the GR-S latex rub-

ber in the line by warning the operator to stop lubrication when system is full. A tell-tale ring of lubricant is extruded around the valve stem when the system is full. Pressurized lubrication, plus very close tolerances between plug and body, assure lubrication of all sealing surfaces without contamination of line fluids; and also provide a positive means of moving the plug downward during each lubrication to assure stick-free operation.

These features add up to lower maintenance costs, and lower cost-per-year valve service for Goodyear.

#### *Case 48 — Alabama Construction Company*

## **Rugged Air Hose**

**HOSE** on a construction job anywhere is in for rough treatment, but the A. E. Burgess Construction Company really put Gates Air Drill Hose to the test north of Birmingham, Alabama.

Drilling, blasting and gouging a road bed through limestone and shale means severe service for all equipment. Air and water hose is especially vulnerable because it lays out in the weather — rocks fall on it; it is walked on, kinked, twisted and run over with everything from pickups to earth mov-

ers. It has to be good.

Hose formerly used could not "stand the gaff" — the normal abrasion, weather and accidents that happen to hose on a construction job. A few weeks in service and it had failed on the job.

The company decided to put Gates 18HB Air Drill Hose to work on its wagon drills. Mr. W. L. Jeffrey, buyer, summed it up like this: "We've found that it pays us to use this rugged hose because it gives us much longer hose life and lower maintenance costs."

### **For More Information**

On any case studies in this issue, write the editors, or use the free reader service card on page 85.

Be sure to mention the Case Study Number.



# Another\* Exclusive Voegt Product



THREADED  
TYPE

## FORGED STEEL WELD COUPLETS

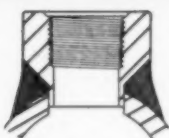


SOCKET WELD TYPE

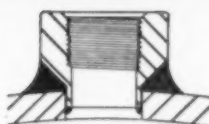
The Voegt Weld Couplet is an easy-to-install fitting for branch connections from pipe, vessels or tanks. It replaces more-difficult-to-install welding bosses, couplings and the type of fittings requiring trimming or matching to fit contour of vessel or pipe.

\*with  
Exclusive  
Voegt  
"WELD RING"

Here's How the Exclusive VOGT "WELD RING" Saves Time and Money!



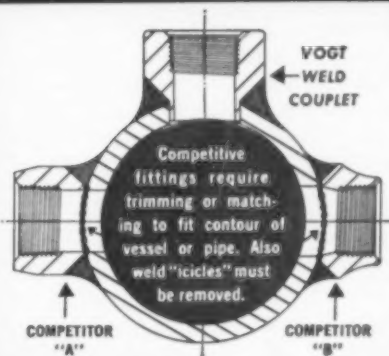
Small Diameter Pipe



Large Diameter Vessel

Voegt Weld Couplets adapt to any pipe or vessel curvature by simply adjusting the height position of the couplet when welding. This characteristic means easy installation, positive positioning and alignment, a stronger weld without distortion, and no inside "icicles" of welding material.

Couplets are available in carbon steel, conforming to A.S.T.M. specifications. Other materials can be supplied on special order.



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# Voegt VALVES, FITTINGS FLANGES & UNIONS

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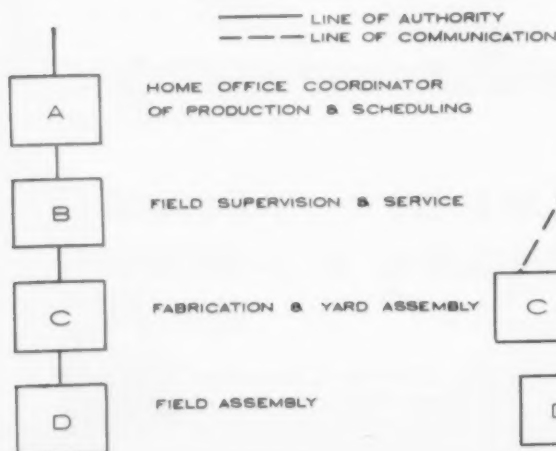
## Organization Charts Can Point Way to Profits

**THE TYPICAL** organization chart is no more useful than a whistle tree on a jet plane. It is always shown to every newcomer to the organization. Then it resumes its normal functions, which are, one — to cover holes in the wall of someone's office; and two — to inflate the ego of the "man at the top."

Any well run organization desperately needs a usable chart, either on paper or in some key man's head. But in order to become a useful tool it must recognize major avenues of communication as well as lines of authority.

Company X was a prime example. The victims of a line type organization that worked well — on paper. They were engaged in installing and maintaining, in widely separated locations, mechanical equipment they assembled in a central yard. Their organization chart looked like the one at left in the sketch.

Men handling functions A and B were out of the home office, worked well together, and were dedicated to the welfare of the company. Functions C and D were handled efficiently by a single outside contractor. This arrangement functioned smoothly. The company prospered and their operations expanded.



By LOUIS H. V. SMITH

MR. SMITH was graduated from Stevens Institute of Technology in 1940 as a mechanical engineer. His engineering career was first with such companies as E. I. du Pont, Eastman-Kodak, and Airtemp Construction Company. Since 1953, he has been an independent consultant with offices in Miami and Sarasota, Florida.



Gradually however, the man handling function C came to discover that he was the real boss, not his superior B. Since C controlled both yard and field assembly, he could exert pressures in various ways to his own company's advantage. Thus A and B became mere figureheads with only the power of acceptance or rejection.

Needless to say, there had to be a drastic and expensive reorganization. All functions remained as before. However, after some lines of authority had been severed, some strengthened, and other lines of communication established, the chart then looked like the one at right in the sketch.

The usual and expected repercussions followed. The man at C was particularly voluble at having his authority redistributed.

After the new arrangement had

been in operation for a short time, however, the advantages became apparent:

1. Control of operations was now in the hands of A and B with both production and field work being co-ordinated by home office personnel.

2. The line of authority A-B was strengthened giving B the functions of an executive assistant as compared to his former role of field inspector.

3. The line of communication A-C was established to enable A to co-ordinate yard production with working schedules for the field crew set by B.

4. By breaking line C-D in favor of line B-D, the work of both yard and field crews could be laid out on the basis of orders on hand. Thus hiring and firing of labor could be arranged in advance of changes in work load.

An additional bonus not foreseen but certainly important, was the ability of the company to expand its operations into other geographical areas. By establishing a yard operation identical to and under the same set of controls as C, a new territory could be opened up. Field crews were organized using personnel from original crews for supervision.

Formerly, operations had been

limited by the ability of C to fabricate and install with the installation often two days travel away from the yard. With the new setup, each job was handled from the nearest yard and the field crews were never more than a few hours from home. Production was limited only by the abilities of A and B to handle co-ordination.

#### Improvements

Discipline of supervision, impossible before, was now simple, quick and effective. No longer did B hear: "I'm sorry, that job will have to wait." Instead, with other yards and other installation crews ready and sometimes anxious to step in on any lagging job, there appeared a sincere effort to improve operations. Schedules were met and quality of work was better.

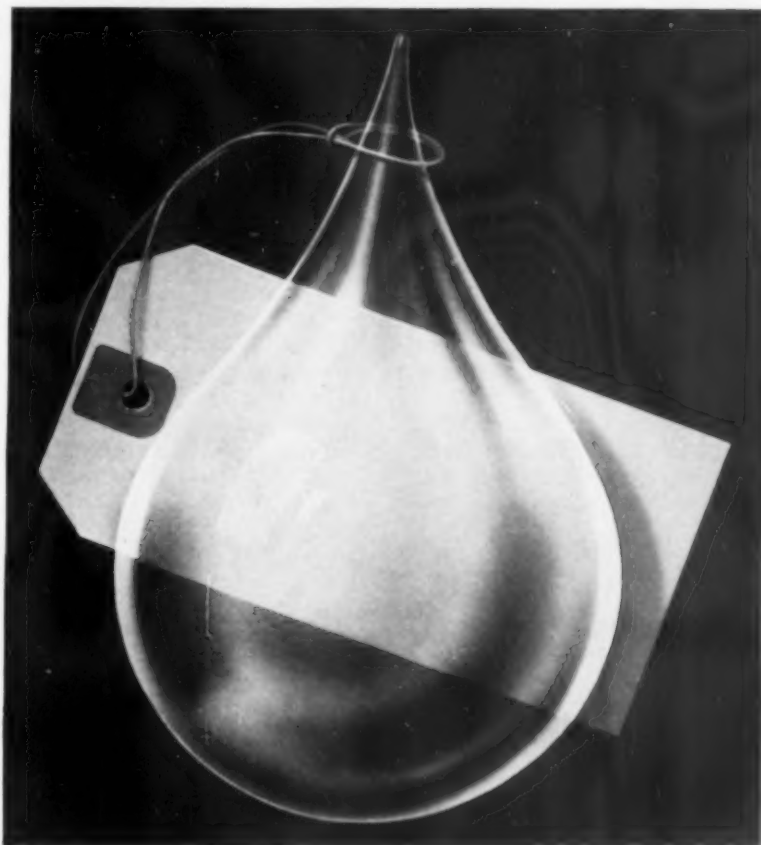
Along with this competitive attitude, there also developed an attitude of confidence on the part of yard and field supervision when tight schedules were announced. Knowing that a pool of trained men existed from which help could be borrowed often caused C (and D too) to agree to and meet production quotas that had been considered impossible under the old organization.

Ridiculously simple in retrospect, these were but a few carefully considered changes on a previously useless organization chart. Properly analyzed and put into practice, they transformed a stagnant company into an aggressively expanding and highly competitive group in a very short time. In this case, the lines and squares were drawn as they existed — not as the previous chart showed, but as they actually were, with due regard for the personalities of the men involved.

Only after management had thoroughly examined existing lines of authority and communication could decisions be made and changes be effected. Fortunately, management was able to realize the latent potential in the home office men, and had the courage to exploit this potential to the chagrin of yard and field management who were working toward control of operations.

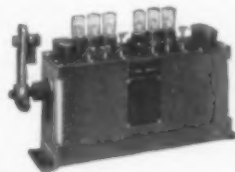
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# Reliability Improved by Grounding Neutral

Case 50 — Southeast

**A LARGE PAPER MILL**, located in the Southeast, was originally built with the neutral of the 2400 volt power system ungrounded. However, as a result of excessive failures of 2300 volt motors, the decision was made in 1953 to ground the neutral of the 2400 volt power distribution system.

Before the neutral was grounded in 1953, records show that there were many cases of simultaneous failures of from two to six large motors at the same time, and in a single year there were as many as 10 separate cases. However, since grounding the neutral, there has not been a single case of simul-

taneous motor failure to date.

Experience in this paper mill has definitely proved that the following benefits are secured from grounding the neutral of the power system.

A. Elimination of multiple motor failures.

B. Reduction in damage from phase-to-phase faults, by reducing the total number of faults.

C. Feeder tripping is secured from ground faults, rather than phase faults, as studies indicate approximately 80% of all faults originate from line-to-ground, and therefore can be cleared by ground relays.

D. Reduction in the number of current limiting fuses that are blown since the motor starter contactor is opened by the ground relay for ground faults, rather than blowing a fuse for ground faults.

As the result of very favorable experience in this mill on account of converting to a grounded neutral system, several other mills are now being converted in a similar manner in order to take advantage of the increased reliability.

*By H. B. GREAR, Senior Application Engineer for the Southeastern Regional Industrial Sales Operation of General Electric*

## Case 51 — Arkansas

### No Lubrication No Lint Coating

**OSCEOLA** Products Co., cotton oil mill at Osceola, Ark., runs its equipment 24 hours a day, seven days a week, during the operating season. Costly loss of production resulted from downtime necessary to replace chain-and-sprocket drives, which never went through a full season.

Being covered with oil, the

chains and sprockets quickly acquired a thick coating of lint. The lint stuck to the oil almost as tenaciously as feathers to tar. It not only impaired efficiency but necessitated replacement of chains or sprockets at intervals much more frequent than normal service life. Obviously the chains and sprockets could not run without lubrication, so there was nothing that could be done about the lint coating and the replacement problem.

Shelby Electric Co., industrial distributor of Memphis, Tenn., suggested the substitution of "Sure-Grip" timing-belt drives for the chains and sprockets. The timing

drive, manufactured by T. B. Wood's Sons Co., retains the advantages of chain-and-gear drives but eliminates metal-to-metal contact and hence there is no need for lubrication.

Molded neoprene teeth on the timing belt engage axial grooves cut in the pulleys. The belt teeth are faced with tough nylon duck to minimize friction and insure added wear resistance. The high tensile strength of the belt does not depend upon thickness but upon helically wound steel cables embedded in the neoprene backing. Being thin, the belt flexes readily without heat build-up. Service life is long, even under difficult conditions.

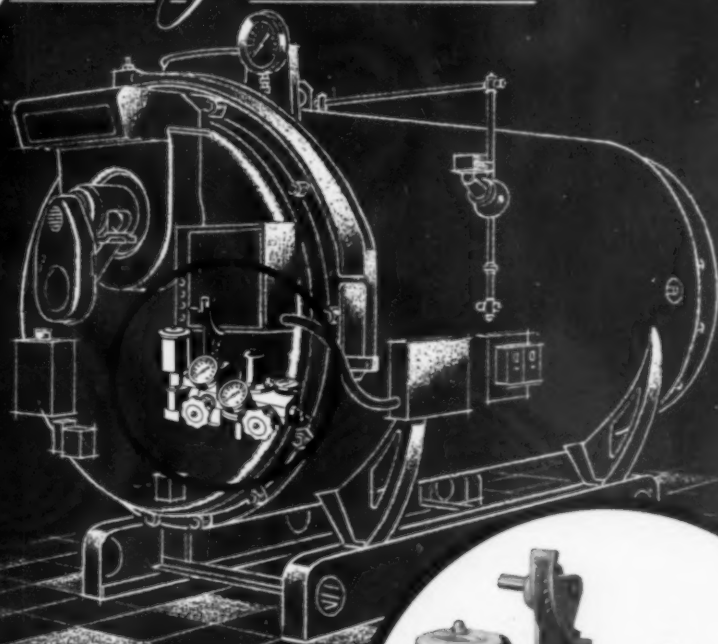
The photograph shows the timing drive, a double extra-heavy 1½ in. pitch with a belt 3 in. wide, between a 7½-hp, 155-rpm gear-motor and a 9-in. double conveyor operating at 105 rpm. One side of the conveyor feeds the linter while the other returns the product for further processing. The conveyor moves approximately 200 tons of cotton seed every 24 hours.

The twin conveyors run 24 hours a day, seven days a week, during the season. At the end of nine months of this gruelling ordeal, neither belt nor metal pulleys had shown any signs of wear.





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## EXAMPLE:

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Look to Cleaver-Brooks for many examples of engineering excellence in action. The single tip burner nozzle, so easy to remove and clean . . . the rotary air damper that gives precise control of air . . . the air nozzle purge . . . all are found exclusively on Cleaver-Brooks boilers, all contribute to greater efficiency in the

burning of fuel. Good reasons why you should *insist* on Cleaver-Brooks.

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SOUTHERN POWER & INDUSTRY for OCTOBER, 1961

For more information, Use Reply Card—Page 85

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# NEW Catalogs & Bulletins

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## MAINTENANCE—TOOLS EQUIPMENT & METHODS

**3—Metallizing**—Use industry's low-cost "putting-on" tool. Now within reach of the smallest shop. Bulletin tells how you can spray carbon steels, stainless, babbitts, brass, nickel, aluminum. — METCO, INC.

**8—Ceramic Coatings** — Chempro sprayed ceramic coatings to resist abrasion, erosion and corrosion described in Bulletin CP-28. Ideal for shaft, shaft sleeves, impellers, valves, cams. — CHEMICAL & POWER PRODUCTS, INC.

**11—Rust Preventives** — Selection factors for proper NO-OX-ID rust preventives for maintenance application featured in Bulletin 3200. Covers type of coating, product, recommended uses, physical characteristics, method of application. DEARBORN CHEMICAL COMPANY.

**14—Hose & Fitting Needs**—Complete Weatherhead line described in bulletins — flared, flareless, or pipe fittings; brass, stainless, carbon; pressures to 10,000 psi; sizes 1/4" to 2" O.D.; production or small maintenance quantities. — DIESEL INJECTION SALES & SERVICE.

**16—Epoxy Coatings** — Form 1014 describes advantages of epoxy coatings for highest resistance to chemicals, wide variety of uses, flexibility and adhesion, and abrasion resistance. — Valdura Paint Division, AMERICAN-MARIETTA COMPANY.

**17—Mechanical Packings** — 32 page Cat. PC-103 describes a variety of packings and gaskets, including self-lubricating, sheet and molded packings. Includes application charts and price information. — GREENE, TWEED & CO.

**26—Temperature-Millivolt Measurement** — Take accurate measurements wherever you go — laboratory, plant or field — with the compact 3 1/2 lb MiniMite null-balance potentiometer pyrometer. Range scales can measure temperatures from minus 450 F to plus 3200 F. Use it for standard checking and calibrating procedures. Automatic cold-junction compensation is built-in. — THERMO ELECTRIC CO., INC.

**27—Corrosion Control Systems** — Brochure 9111 outlines five-step procedure for primary protection and preventive maintenance of all metal

surfaces subject to acids, alkalis, solvents, fumes and gases. — TRUSCON LABORATORIES.

**35—Stop Corrosion**—4 page bulletin tells how Alkasteem neutralizes carbon dioxide and Ox-Gem reacts with oxygen to stop corrosion in boilers, heaters, condensate returns, steam lines and traps. — ANDERSON CHEMICAL COMPANY, INC.

**50—Industrial Weed Problems?** — Any man can weed-proof 10,000 sq ft in ten minutes with Ureabor — the dry granular weed-killer. You only use 1 to 2 lb per 100 sq ft. Folders give details on long-lasting control and your nearest distributor. — UNITED STATES BORAX & CHEMICAL CORP.

**51—Chimney Protection**—New non-asphaltic, spray applied coating for use in concrete, steel, and brick chimneys inhibits corrosion from acid exhaust gases. Customer field tests rate STACKFAS outstanding on heat, acid and fly ash abrasion resistance. — BENJAMIN FOSTER COMPANY.

**54—Repair & Maintenance Products** — Complete product line shown in use with prices, sizes, weights, colors and styles. All products distributed by Rasco's 11 Southeastern Branches. — REYNOLDS ALUMINUM SUPPLY CO.

**55—Better Tube Maintenance** — Catalogs describe how line of air-powered tools and accessories (condenser cleaners, tube cutters, expanding brush head cleaners, etc.), are job-fitted to specific tube repair operations. — AIRETOOL MANUFACTURING COMPANY.

**63—Heat-Proof Coatings** — 4-page Form MPC 5-460 tells you how to stop corrosion and destruction of metals with heat-proof protective coatings. — MARKAL COMPANY.

**72—Vinyl Spray** — Bulletin describes the Aerosol vinyl spray for instant repair and protection — an air dry vinyl coating which adheres to practically any clean, dry surface. — QUELCOR, INC.

**77—Plant Health Aid** — Automatic footsprayer dispenses skin-toughening solution for prevention of athlete's foot. One gal of solution sufficient for 3,000 treatments. Catalog S-12 gives details. — ONOX, INC.

**91—Heavy-Duty Paints** — 1961 Valdura catalog, 32 pages, covers rust inhibitors, primers, corrosion re-

sisting coatings, etc., for industrial use. — AMERICAN-MARIETTA COMPANY.

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## FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**109—Process Pumping** — Factors of best economic balance in process pumping offered by new pipe-mounted centrifugal pumps highlighted in Type SPM Bulletin 142. — PACIFIC PUMPS.

**135—Air Cooled Heat Exchanger** — Bulletin 132 describes air-cooled unit to solve the problem of water supply and disposal, cooling fluids or condensing vapors, removing heat at rate of input for close control of temperature. All parts of unit always accessible for easy maintenance with cleanable coils. Replaces both cooling tower and surface condenser. — NIAGARA BLOWER COMPANY.

**154—Chemical Feeders** — Bulletin 202, 4 pages, illustrates and describes the Ful-O-Feeder chemical system for continuous heavy duty service. — FULBRIGHT LABORATORIES, INC.

**170—Pumping Problems?** — Two stage, Type JC pump will meet requirements up to 650 gpm. Horizontally split casing top can be taken off quickly for inspection and rotating parts removed and replaced without disturbing piping, connections, fittings or driver. — THE WEINMAN PUMP MFG. CO.

## INSTRUMENTS—METERS CONTROLS—REGULATORS

**207—Control Centers & Systems** — Combustion safeguard and automation packaged control centers insure full coordination of complete system, place responsibility on one source, insure correct wiring, and reduce field labor. Catalog C11 illustrates variety of designs and circuits now in use. — WEBSTER ENGINEERING CO.

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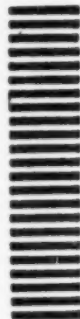
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**208—Water Level Alarms—Brochure**  
D1 — Float operated low and high water level alarms and fuel cut-offs, for low and medium pressure boilers, tanks and other vessels. — RELIANCE GAUGE COLUMN CO.

**211—Butterfly Valves —** Folder supplement to Catalog 307 stresses flexibility in valve line for controlling large volumes of liquids or gases. Valve actuators, special arrangements, shaft extensions, and electric actuators and positioners are featured. — MASON-NEILAN.

**213—Meters & Controls —** Bulletin G15-1 describes and illustrates systems and instruments used in the measuring, transmitting, receiving, interpreting and controlling of 18 variables normally encountered in power plant and industrial plant operation. — BAILEY METER COMPANY.

**224—Feedwater Regulator—**Bulletin 1044 describes the BI Feedwater Regulator, the single-element unit employing a thermostatic-tube level controller which actuates a regulating valve in feed line. For loads from 10 to 785 psig. Includes specifications table and schematic diagram. — COPES-VULCAN DIV.

**235—Liquid Level Gauges—**Bulletin 463A describes automatic remote reading systems for nearly any liquid. Features include easy to read dial indication. — LIQUIDOMETER CORP.

**253—Combustion Analyzer—**4 page Specification E65-5 describes the "Heat Prover" which indicates per cent by volume oxygen and combustibles present in exhaust gases from all types of boiler and industrial furnaces. — BAILEY METER CO.

**255—Temperature Regulators —**"Sliding Gate" units are simple, low cost, self-operating, automatic control valves for heating or cooling applications. Action easily reversed by rotating seats 180°; self-powered — no electricity or compressed air needed; easy to install. Bulletin J-180-1 describes ten standard ranges from 35-450 F. — OPW-JORDAN.

**267—Remote Liquid Level Indicators —**Bulletin RI-1825 describes indicators for pressures up to 3000 psi — advantages, operation and specific installations. — YARNALL-WARING COMPANY.

#### PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

**300—Buyer's Guide—**Up-to-date industrial and maintenance building products stock list. Includes complete listing of all Rasco distributed products plus branch locations. — REYNOLDS ALUMINUM SUPPLY CO.

**304—Backing Rings —** Bulletin 56-2 describes rings for fast, economical fit-up in piping, tubing, fittings and valves. Shows how rings assure

uniform complete-penetration welds and ease of handling in shop and field. Carbon steel, wrought iron, chrome alloys, stainless, aluminum and copper. — ROBVON BACKING RING CO.

**305—Compressed Air Dryers —**Stop freezing of air lines inside and outside the plant; extract moisture and foreign particles; protect pneumatic equipment against corrosion and operate for less than 1-cent per 18,000 cu. ft. 16-page brochure with charts gives details. — VAN PRODUCTIONS CO.

**306—Steel Buildings —**Shed roof, gable roof frameless and gable roof rigid frame units described in Catalog SX-13757. 5,000 sizes available to meet all space needs. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

**310—Incinerator —**Metal cased, insulated, refractory lined incinerators for industrial and commercial use. City smoke code approved. Fast, economical installation — any size and capacity. — NORTH STATE PYROPHYLITE CO., INC.

**324—Painting New Plants —**"Plan Painting of New Plants to Reduce Costs" describes how lead-suboxide paints can save 1 or 2 coats of paint on new plants. Eventual repainting costs are cut as well since these paints form a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming. — SUBOX INC.

**342—Power Roof Ventilators —**Bulletin 550 describes V-belt driven centrifugal type power roof ventilators. Pressures to 2" SP; capacities from 1500 to 26,500 cfm. — CLARAGE FAN CO.

**386—Rigid Frame Buildings—**8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

#### PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

**401—Steam Traps —**Bulletin 775 gives price, dimension and capacity data on Open Float and Thermostatic Steam Traps for trouble-free heating service. — ARMSTRONG MACHINE WORKS.

**403—Valve Operators—**Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

**409—Lubricated Plug Valves—**Catalog PV-4 covers operational features. Quarter-turn to open or close; lubricant grooves provide positive seal when valve is closed; when open, seating surfaces not exposed. — THE WM. POWELL COMPANY.

**415—Steam Trap —**Bulletin No. 455-B describes the Float-Thermostatic steam trap with its entire operating element in one unit making it removable without disturbing inlet and outlet connection to the semi-steel trap body, suitable for 125 psi steam pressure. — SARCO COMPANY, INC.

**417—Welding Fittings —**Seamless and welded fittings featured in Bulletin 60-C. Features industry's most complete line of directional changes, branch connections, flanges and special types. — MIDWEST PIPING COMPANY.

**420—Valves —**24 page catalog illustrates and describes bronze, iron, steel and corrosion-resistant valves for controlling the flow of water, oil, gas, steam and corrosive fluids. — THE WM. POWELL CO.

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See pages 85 & 86

**429—Expansion Joints —**Advantages of the Gun-Pakt expansion joint described in Bulletin EJ-1917. No shutdowns for repacking. Installation suggestions. — YARNALL-WARING CO.

**435—Liquid Level Controls —**Cat. 405 gives full details and specifications of wide-range types of controls for a wide variety of applications. Employ torque tube packless design. Six types of mounting connections. — MASON-NEILAN DIV.

**443—PVC Fittings & Flanges—**Corrosion resistant polyvinyl chloride pipe fittings and flanges covered in 12 page catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures and field tests. — GRINNELL COMPANY, INC.

**452—Pipe and Tubes —**42 page Bulletin 26 gives types of steel tubes, tensile, creep and rupture properties, welding and forming data, applications and other valuable information. — National Tube Div., UNITED STATES STEEL CORP.

**463—Stainless Steel Valves —**Catalog 59 SS describes gate, globe and swing check valves with valve patterns in alloys that satisfy requirements of most corrosive services. Includes section on resistance of alloys to many corrosive media under varying conditions. — JENKINS BROS.

**468—Steam Traps —**40 page engineering manual aids engineers and maintenance men in sizing, specifying and buying of steam traps and other fluid specialties. All data necessary to engineer a trap installation is included. — V. D. ANDERSON CO.

## Bulletins (Cont.)

**487—Power & Process Piping** — Offering single responsibility, specialized service, integrated facilities for all piping, Catalog 60B highlights erection, fabrication and welding fittings details. Case studies from the South-Southwest. — MIDWEST PIPING COMPANY.

**488—Power Piping Field Erection** — Increased importance of piping erection proficiency is stressed in new 12 page brochure. Tells how field erection costs and quality are controlled and discusses welding and other technical aspects. — THE M. W. KELLOGG COMPANY.

**493—Unions & Swing Check Valves** — Engineering data, sizes, weights and dimensions on Perfect Seal Pipe Unions and Swing Check Valves featured in 20 page Cat. 60. Also includes Gasketless Cup-Orifice Unions and Ductile Iron Check Valves. — CATAWISSA VALVE & FITTINGS CO.

**498—Temperature Control System** — New air-control system will tame wide ranging, fast changing loads of instantaneous heaters and modern heat exchangers. Cascade principle plus use of extremely fast responding bi-metal temperature sensing element reduce time lags and provide control stability. Bulletin 9 gives details. — SPENCE ENGINEERING COMPANY, INC.

### BOILERS—STOKERS BURNERS—FUELS

**502—Feedwater Treatment** — 4 page catalog tells how Braxton and Flako internally condition water to remove and prevent scale formation and corrosion in boilers. — ANDERSON CHEMICAL COMPANY.

**513—Compact Economy Boiler** — Side-fired units give 20% more usable floor space than end-fired units of same capacity. Largest model of line only 134" x 76" — gas or oil fired 6 to 50 hp; 100 to 125 lb pressure; 201,000 to 1,673,950 Btu/hr capacity. Wired, assembled and tested at factory. Catalog 140 gives details. — LOOKOUT BOILER & MANUFACTURING.

**515—Packaged Steam Generators** — Bulletin PSG-3 describes factory assembled portable type units from 10,000 lb/hr to 48,000 lb/hr capacities. Gives construction details and dimensions. In standard pressures of 175, 250 and 375 psi. — HENRY VOGT MACHINE CO.

**516—Fuel Savings** — How the packaged Ljungstrom air preheater boosts performance and offers fuel savings for small boilers and process applications is highlighted in 14 page bulletin. Boiler as small as 25,000 lb/hr can have advantages of regenerative preheating — saves fuel, boosts output, and permits use of

lower grade fuels. — THE AIR PRE-HEATER CORPORATION.

**517—Generating Steam?** — Get this complete story on boiler operation, maintenance and equipment with suggestions on preventive control. Prevent costly shut-down caused by mineral deposits and corrosion. — FULBRIGHT LABORATORIES.

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See pages 85 & 86

**529—Boiler-Burner Lease Plans** — New rental plan for Power-master boilers and burner systems covers use of equipment and cost of installation without capital investment. — ORR & SEMBOWER, INC.

**535—Packaged Boilers** — For steam, 15-250 psi, or hot water; gas or combination oil/gas firing; factory tested; guaranteed 80% fuel-to-steam efficiency for fuel economy; quiet; four-pass forced draft design; field started. Bulletin AO 184 gives details. — CLEAVER-BROOKS COMPANY.

**536—Automatic Boiler-Burner Unit** — Assembled plant (Scotch-type, two-pass) for all heat or power applications, low pressure or high pressure; burner to match for heavy oil, light oil, or combinations of gas/light or gas/heavy oil. Easy maintenance. Bulletin SPI-100 gives details. — INDUSTRIAL COMBUSTION, INC.

**537—Waste Heat Boilers** — Economical utilization of excess heat from diesel exhaust gases and from industrial and chemical processes described in Bulletin WHB-47-4. Bare tube and extended surface designs of varying capacities and applications covered. — FOSTER WHEELER CORPORATION.

**542—Underfeed Stoker** — Illustrated Cat. 401 gives complete data on double retort underfeed stoker built for heavy duty service in intermediate size range for boilers of 20,000 lb to 34,000 lb of steam/hr capacity. — DETROIT STOKER CO.

**553—Boiler Start-Up** — Bulletin 1048 describes a moving temperature probe which patrols critical boiler gas passages and warns of incipient hot spots during lighting off. Includes structural details and specifications of probe as well as explanations of operating features and methods of control. — COPES-VULCAN DIVISION.

**558—Boiler Auxiliary Package Units** — Packaged system of various compact combinations of deaerating feedwater heaters, boiler feed pumps, condensate surge tanks and blow-off tanks described in Bulletin 59-1. Standard units for steam plants of 10,000 to 100,000 lb/hr capacity and pressure to 300 psig. Higher capacity units also available. — WICKES BOILER CO.

**570—Seamless Boiler Tubes** — 44 page Bulletin 12 contains complete description of manufacture, advantages, tolerances, allowable stress and working pressures, bursting strength, weights, steam properties and other data. — NATIONAL TUBE DIV., UNITED STATES STEEL CORP.

**571—Hot Water Boilers** — Venturi-action mixing tube in new Type CC design obtains more effective use of natural flow pattern for maximum efficiency in hot water heating. Catalog CCW-15 describes units to 11-720,000 Btu/hr; Catalog CFS-15 sizes to 20,100,000 Btu/hr. 4-pass down-draft design; 5 sq ft of heating surface per bhp; built-in induced draft; firing gas, oil or both. — SUPERIOR COMBUSTION INDUSTRIES.

**574—Packaged Generator** — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specifications. Available with gas, oil, and combination gas/oil fuel systems. — TEX-STEAM CORP.

### POWER TRANSMISSION MATERIAL HANDLING

**600—Mechanical Shaft Seals** — Chempro mechanical external seal described in Bulletin CP-551. First seal designed for complete interchangeability with packing. No mounting clamps, machinery stuffing box faces or drilling holes. Install in 30 min. Adjust after installation. — CHEMICAL & POWER PRODUCTS, INC.

**605—Cranes & Hoists** — Production moves faster, more efficiently and you increase usable storage space with Job-Mated cranes and hoists. Bulletin gives the right combination of capacity, clearance, speed, controls and components to handle each job best. — SHEPARD NILES CRANE AND HOIST CORP.

**608—Side-Loading Trucks** — One unit can easily load, stack and transport long, bulky selective loads. Traveler loader maneuvers in aisles only 6½ ft wide; electric and gas powered units; low maintenance features. — BAKER INDUSTRIAL TRUCKS.

**614—Vertical Transportation** — Catalog A-382 describes and illustrates details of passenger and freight elevators and escalators for use in all types of industrial plants. — OTIS ELEVATOR CO.

**625—Job-Mated Hoists** — Capacities from ¼ to 30 tons; motor-driven or push-type trolleys; single or mul-

tiple speed controls; pushbutton, pendant rope, or lever controllers; floor or cab operation; vapor-proof or explosion-proof construction. — SHEPARD NILES CRANE AND HOIST CORP.

**WATER TREATMENT—HEATING  
& AIR CONDITIONING—DUST &  
FUME CONTROL—REFRIGERATION**

**700—Peak Load Problems?** — Keep your air conditioning and refrigeration systems operating at maximum efficiency during peak load months. Catalog tells how Anco treatment removes rust and scale and kills slime and algae in equipment. — ANDERSON CHEMICAL COMPANY.

**702—Water Conditioning** — Bulletin 611C, 20 pages, describes manual and automatic softeners, zeolites and ion exchange resins, mixed-bed and multi-column deionizers, dealkalizers, ion exchange systems, filters and purifiers, and water treating chemicals. — ELGIN SOFTENER CORPORATION.

**703—Industrial Air Conditioner** — Bulletin 122 describes methods to obtain control of air properties with accuracy of 1% in R. H. and 1 F in temperature (up to 140 F dew point) with compact high capacity apparatus. Entirely independent of the use of moisture-sensitive instruments. — NIAGARA BLOWER COMPANY.

**706—Centrifugal Blowers & Exhausters** — Catalog ACB-104 covers units providing uniform air pressure up to 10 psi, or vacuum up to 12-in. of mercury. Volumes to 20,000 cfm. Line provides clean, dry air or gas at constant pressure for many processes. — Air Appliance Div., HOFFMAN INDUSTRIES.

**709—Purer Process Water** — Data tells how Ferri-Floc (ferric sulfate) can help with coagulation and softening, removal of iron and manganese and other water purification problems. — TENNESSEE CORPORATION.

**713—Electric Precipitators**—26 page Bulletin 104 shows how units meet five engineering requirements —positive control of gas flow; high, uniform electrode emission; effective continuous cycle rapping; and safe, trouble-free high voltage equipment. Gives 9 steps to successful installation. — BUELL ENGINEERING COMPANY, INC.

**714—Algae in Cooling Towers**—Special report is two-year study of algae in cooling towers in all parts of the country. Valuable reference piece for your water treatment library. — DEARBORN CHEMICAL COMPANY.

**719—No Frost Refrigeration** — Bulletin 105 describes with diagrams and photographs method used for food freezing, chilling and warehouse refrigeration on largest scale without frost or ice formation,



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## Bulletins (Cont.)

insuring full capacity and uniform temperature.—NIAGARA BLOWER CO.

**724—Chemicals & Services** — Water treatment chemicals and engineering services for The Industrial South-Southwest highlighted in 12 page Bulletin 5000-A. Specific products and their functions detailed. — DEARBORN CHEMICAL CO.

**733—Air Handlers** — Technical bulletins describe air handling units 665-47,000 cfm capacity. — ACME INDUSTRIES, INC.

**736—Coagulant Aids** — Product reports and case studies available on seven new Claracel formulations — effective flocculating agents and coagulant aids for use in potable water supply systems.—THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 85 & 86

**742—Water Treating Equipment Guide**—Bulletin 615 illustrates and describes the newest in manual and automatic zeolite water softeners, demineralizers and deionizers, dealkalizers, etc. Spray and tray type deaerating heaters and water treating chemicals also included. — ELGIN SOFTENER CORP.

**752—Automatic Water Control** — 4 page bulletin describes Chemtrol control for treatment of cooling tower water. Adaptable to any size unit, in any location, and to any type water, it controls pH, prevents scale, controls corrosion and eliminates algae — all simultaneously, completely automatically and economically. — WATER SERVICES INC.

**757—Boiler Water Treatment**—Data sheets P-101 through P-107 summarize products and their application. — FULBRIGHT LABORATORIES, INC.

**767—Packaged Industrial Fans** — Self-contained, packaged units Type XL available with either open type wheel for handling materials or high efficiency backplate wheel for light dusts and fumes. Hinged cover encloses motor, drive and bearings for weatherproof installation. — CLARAGE FAN COMPANY.

**780—Cooling Water Control** — Bulletin describes the Chemicator . . . for automatic control of scale, corrosion and slime in cooling towers

and evaporative condensers. Trouble-free design with no moving parts. — IPCO LABORATORIES, INC.

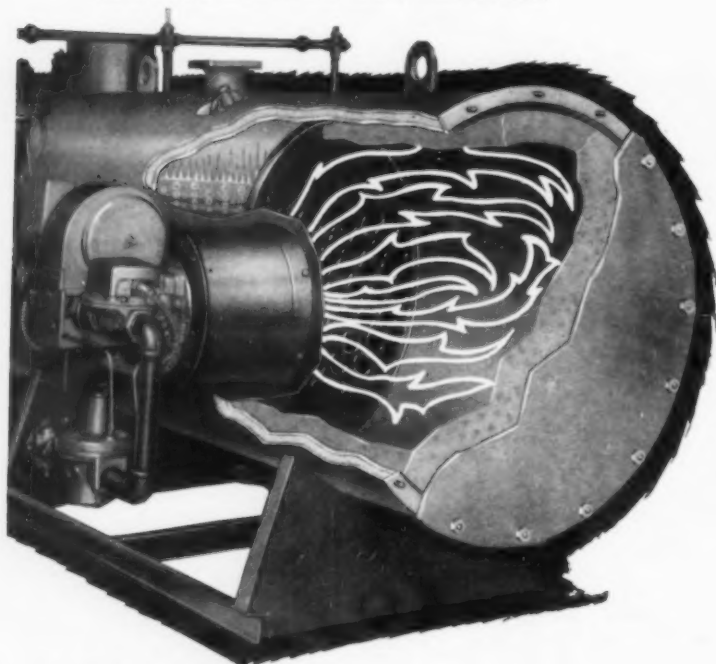
## Late Bulletins

**V-1—Maintenance Materials** — 1961-62 Catalog & Price List, 22 pages, includes 75 products for industrial maintenance, with over 30 illustrations. Highlights new instant floor patch, Magic Floor, applied by rolling with ordinary lift truck, and a spray process for resurfacing roofs. Includes other floor and roof repair applications, machinery anchoring and grouting, and electric motor cleaning. — RANCO INDUSTRIAL PRODUCTS CORP., 13311 Union Ave., Cleveland 20, Ohio.

**V-2—Packaged Boiler**—Bulletin No. 1265 presents the Powermaster hot water boiler, designed for modern forced circulation hot water heating systems, and featuring side located furnace, 5 to 1 turndown, and quiet operation. — ORR & SEMBOWER, INC., Reading, Pa.

**V-3—Gate Valves** — Circular 561, 4 pages, describes "King-clip" gate valves made in the iron-body, bronze-mounted type for general

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Lookout SF horizontal boilers give you up to 20% more usable floor space than end-fired boilers of the same capacity. Mounting the burner on the side makes these new boilers so compact the largest model in the line is only 134" long by 76" wide. All boilers are fully automatic, fully equipped, including complete combustion safeguards . . . built to ASME code standards . . . completely assembled and test fired at the factory and shipped ready to go. Welded-steel construction, conservative ratings, and plenty of reserve capacity for peak loads make them the best buy in a compact economy boiler.

Your Lookout dealer can show you why you get more value for your boiler dollar with a compact, economical Series SF automatic boiler — see him for the facts, or write for our new Catalog No. 140 today.

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Chattanooga 5, Tennessee



corrosive service, and the all iron for solutions which attack bronze but not iron. — LUNKENHEIMER CO., Cincinnati 14, Ohio.

**V-4—Heat Transfer** — Tech. Data Bulletin 356, 26 pages, introduces "Panelcoil" heat transfer surface for economical, convenient, industrial uses. Covers coils, heating and cooling, and tank panel coils. — DEAN PRODUCTS, INC., 1042 Dean St. Brooklyn 38, N. Y.

**V-5—Fuel Oil Heaters**—Bulletin 200 presents improved line of fuel oil heaters, used on the suction line of the pump for heating viscous fluids, such as Bunker C oils and other heavy liquids, in order to reduce viscosities so that they can be readily pumped. — BROWN FINETUBE COMPANY, 300 Huron St., Elyria, Ohio.

**V-6—Flow Alarm**—Bulletin Supplement, Index ML-18W.6-1, 1 page, describes the "Flo-Eye" indicator alarm, and gives construction and operating details for this new adjustable device. — SCHUTTE & KOERTING COMPANY, Dept. MA-6, Instrument Div., Cornwells Heights, Bucks County, Pa.

**V-7—Bundle Heat Exchangers**—Bulletin 0-1162, 6 pages, offers a new line of removable tube bundle heat exchangers having an externally packed floating head of improved de-

sign. — BASCO, INC., North Tonawanda, N. Y.

**V-8—Duct Heater Assemblies**—Bulletin GA-61, 4 pages, describes gas-fired duct heater assemblies for factories and other large buildings. Gives specifications, drawings, floor area coverage, and other pertinent data.—L. J. WING MFG. CO., Linden, N. J.

**V-9—Power Tools**—Catalog AB-61, 96 pages, describes extensive line of industrial power tools and accessories, including new 20-in. and 17-in. power feed drill presses, new 12-in. cut-off machine, and 7-in. standard grinder. — ROCKWELL MFG. CO., Delta Power Tool Div., 491 N. Lexington Ave., Pittsburgh 8, Pa.

**V-10—Control Valves** — Bulletin E600, 64 pages, covers pneumatic diaphragm and piston actuators, and a wide variety of valve body assemblies, with information necessary for selection. Accessories are included. — FISHER GOVERNOR COMPANY, P. O. Box 307, Marshalltown, Iowa.

**V-11—Overhead Cranes** — Bulletin No. 15005-1B-61, 20 pages, illustrates and describes the new Shaw-Box line of Series D overhead electric traveling cranes, for regular duty service in all types of industry. — MANNING, MAXWELL &

MOORE, INC., Muskegon, Mich.

**V-12—Industrial Fans**—Bulletin No. A-1203, 44 pages, discusses construction features of HS fans and describes available drive arrangements, configurations and types of drive. Capacity tables are included. — AMERICAN-STANDARD INDUSTRIAL DIVISION, Detroit 32, Mich.

**For More Free Data FILL IN CODE NO. on the Handy Return Card — Page 85**

**V-13—Metal Surface Protection** — Folder is a practical guide to primary protection and preventive maintenance of surfaces subjected to chemicals, gases, and weathering. — TRUSCON LABORATORIES, 1700 Caniff, Detroit 11, Mich.

**V-14—Machining Aluminum** — Brochure answers questions on speeds for machining aluminum on screw machines; alloys with best machinability; recommended coolant-lubricants; tool materials and angles. — REYNOLDS METALS COMPANY, Dept. PRF-49, Richmond 18, Va.

**V-15—Gasket Materials** — Bulletin AD-190, 24 pages, introduces the newer gasket materials including "Vitron," Silicone, Neoprene, and Teflon. Furnishes selection data for material and design. — GARLOCK INC., Palmyra, N. Y.

## INFRA-RED HEATING? I'VE GOT THE INFORMATION

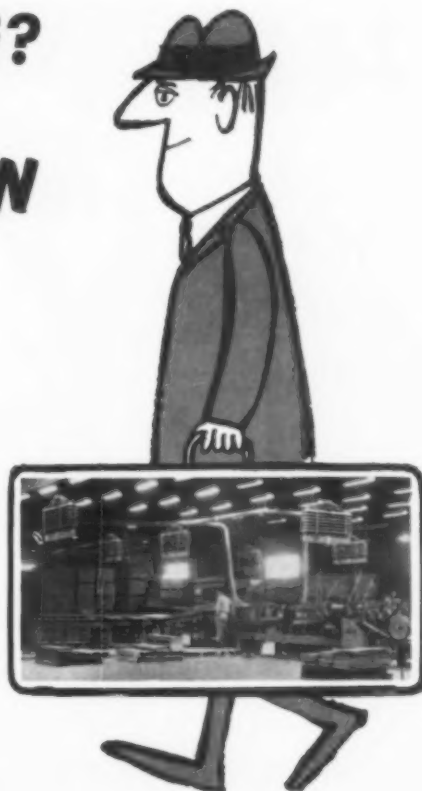
There is no mystery about infra red heating. Overhead gas fired Panelbloc can do almost any kind of commercial or industrial heating job and do it well. I can show you that Panelbloc needs no electrical connections, there are no fans, motors or blowers. Panelbloc "heats like the sun", warms everyone and everything in its effective range. I can show you Panelbloc is AGA, Underwriters and CGA approved. It is low in first cost and economical in its trouble-free operation. I am your Panelbloc man.

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### PANELBLOC DIVISION

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## Bulletins (Cont.)

**V-16—Cutting Tools** — Catalog No. 779A, 12 pages, tells how to select the right tool for the job. Includes general purpose and special cutters and related items. — H. K. PORTER, INC., Somerville 43, Mass.

**V-17—V-Belt Drives** — Catalog DH-901, 24 pages, provides design information on V-belt drives; tables on sheave diameters, belt lengths; service life, and other pertinent data. — THE GATES RUBBER COMPANY, 999 S. Broadway, Denver 17, Colo.

**V-18—Steam Condenser** — Catalog W-503, 8 pages, describes reverse-flow, self-cleaning steam condenser with patented design to eliminate down time for cleaning. — C. H. WHEELER MANUFACTURING COMPANY, Dept. G19, 19th & Lehigh Ave., Philadelphia 32, Pa.

**V-19—Motorized Drives** — Bulletin MD-1, 6 pages, gives descriptive and performance data on gearmotors and "Line-O-Drive" coupled speed reducers. — HOWELL ELECTRIC MOTORS COMPANY, 16316 W. Seven Mile Road, Detroit 35, Mich.

**V-20—Protective Clothing**—Code No. 112-113, 2 pages each, describe Plastismith Inc.'s Handgard work gloves and Footgard boots, both made of disposable polyethylene for

protection of personnel and products.—FARRIS CHEMICAL EQUIPMENT & SUPPLY CO., 203 N. Weisgarber Road, Knoxville 19, Tenn.

**V-21—Multi-Stage Turbines**—Bulletin GEA-7152 describes a complete line of single-valve, multi-stage mechanical drive turbines for various applications and flow requirements.—GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

mum working pressure 1200 psi. — GOULDS PUMPS, INC., 223 Black Brook Rd., Seneca Falls, N. Y.

**V-24—Stop Nuts** — ESNA Design Manual No. 101, 18 pages, recommends installation torque values for UNC and UNF hex type Elastic Stop Nuts, with tables of pertinent data. — ELASTIC STOP NUT CORP. OF AMERICA, 2330 Vauxhall Rd., Union, N. J.

**V-25—Split-Body Control Valves** — Bulletin LB-4, 16 pages, details the construction and operation of the single-seated, split-body LB valve, and points out its maintenance-saving features. — CONOFLOW CORPORATION, 2100 Arch St., Philadelphia 3, Pa.

**V-26—Positioner** — Bulletin 1077, 4 pages, describes a new positioner for use with either diaphragm or piston operated control valves, and with all types of pneumatic drive units. — BLAW-KNOX COMPANY, Copes-Vulcan Division, Erie 4, Pa.

**V-27—Process Thickener** — Bulletin No. 3002, 24 pages, describes complete line of thickeners for chemical, metallurgical and industrial processing. Lists standard sizes and specifications. — DORR-OLIVER INCORPORATED, 77 Havemeyer Lane, Stamford, Conn.

**V-28—Phosphate Handling**—Booklet describes system and equipment for the pneumatic bulk transport,

## KEEP UP-TO-DATE USE SPI READER SERVICE

See pages 85 & 86

**V-22—Dial Thermometers** — Catalog 155, 20 pages, presents bi-metal actuated dial thermometers for industrial use. Shows construction features, sizes, stem lengths, dimensions, weights, and general specifications. — MANNING, MAXWELL & MOORE INC., Stratford, Conn.

**V-23—High Pressure Pumps**—Bulletin No. 722.4, 8 pages, gives information on multi-stage centrifugal pumps in capacities up to 2600 gpm for heads up to 3400 ft, and maxi-

## BETTER TOOLS FOR BETTER WORK

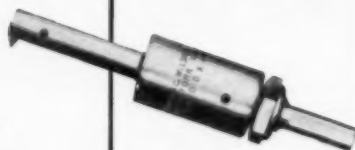
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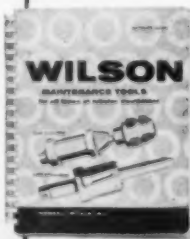
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storage and handling of phosphate products, including storage facilities, piping and venting, conveying and weighing. — MONSANTO CHEMICAL CO., Inorganic Chemicals Division, 800 N. Lindbergh Blvd., St. Louis 66, Mo.

**V-29—Differential Regulator**—Bulletin PNB 8-61, 3 pages, lists prices and gives engineering and technical information on the new No. 167 series valve, available in ductile iron or bronze in  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch sizes. — OPW-JORDAN, 6013 Wiehe Road, Cincinnati 37, Ohio.

**V-30—Spiral-Wound Gaskets**—Bulletin AD-176 carries complete information on the 1/16", paper thin "Guardian" gaskets and the new high temperature gasket made with ceramic filler materials. — GARLOCK INC., Palmyra, N. Y.

**V-31—Two-Ton Cranes**—Catalog Sheet 607A introduces the HP-2 Series of 2-ton capacity mobile multipurpose floor, truck and pedestal mounted hydraulic cranes. — RUGER EQUIPMENT, INC., 615 West Fourth St., Uhrichsville, Ohio.

**V-32—Cooling Water Treatment**—Bulletins C-303, 323, 324, and 325, cover four items in a new line of cooling water treatment products, designed specifically for medium and small sized air conditioning installations. — DEARBORN CHEMICAL COMPANY, Merchandise Mart Plaza, Chicago 54, Ill.

**V-33—Potentiometers**—Data Sheet E-33(5) includes three new low-cost portable potentiometers designed for on-the-spot measurement of temperature for instrument maintenance departments, testing and research. — LEEDS & NORTHUP COMPANY, 4934 Stenton Ave., Philadelphia 44, Pa.

**V-34—Trolley Conveyors**—Book 2730, 58 pages, tells what a trolley conveyor can do to reduce manufacturing and handling costs, and how to select the right trolley conveyor for any requirement. — LINK-BELT COMPANY, Prudential Plaza, Chicago 1, Ill.

**V-35—Floor-to-Floor Handling**—Bulletins 132A and 133A, 2 pages each, tabulate outstanding features of units built for inexpensive, labor-saving flow of products between floors. — HYTROL CONVEYOR COMPANY, INC., 1959 S. 54th St., Milwaukee, Wisc.

**V-36—Air Conveyor Systems**—Bulletin 228, 8 pages, shows all standardized components, capacities, horsepower requirements, and ordering instructions for 4 standardized pneumatic air conveying systems. — SPROUT, WALDRON & CO., INC., Muncy, Pa.

**V-37—Control Panels**—Bulletin G-9 discusses control panels for a wide variety of automatic materials handling systems, with the four basic types illustrated and described. — FULLER COMPANY, Catasauqua, Pa.



# HOT-DIP GALVANIZING

by

# DIXISTEEL

TRADE MARK

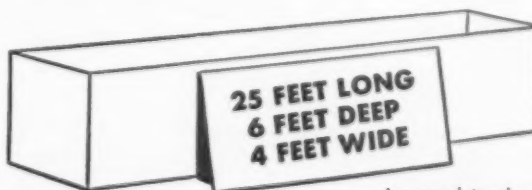
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Nothing protects iron and steel from rust better than zinc. And nothing applies zinc better than hot-dip galvanizing.

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up to 45' long  
by double-dipping



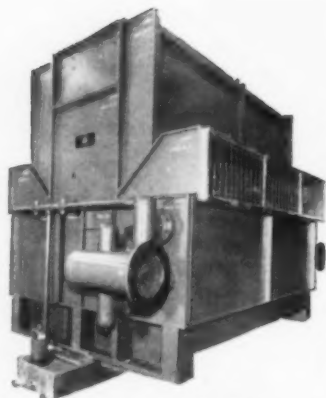
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## You Get EXTRA SAVINGS From This Method of Compressed Air After Cooling

Cooling water savings and power savings quickly repay the cost of the Niagara Aero® (air-cooled) After cooler for compressed air or compressed gases. In addition its long life and the labor-saving simplicity of its maintenance give you an extra profit in comparison with water-cooled surface contact methods.

With the Niagara After Cooler the heat of compression is removed and dispersed into the atmosphere by the evaporation of a very small amount of water. The compressed air temperature is always brought below that of



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Large users of compressed air for plant services or processes choose Niagara Aero After Coolers for their dependable durability. They have been making good records of service for over 25 years.

*Write for Bulletin 130.*

### NIAGARA BLOWER COMPANY

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*Niagara District Engineers in Principal Cities of U. S. and Canada*

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- J. L. Goodman & Son, Hickory, N. C.
- Joe Moore & Company, Raleigh, N. C.
- Summers Hardware & Supply Company, Johnson City, Tenn.
- McBurney Stoker & Equip. Co., Atlanta, Ga.
- Brown-Rogers-Dixon Co., Spartanburg, S. C.
- Way Fire Brick Co., Churchland, Va.
- Muse, Inc., Johnson City, Tenn.
- Ed Salmon, Tampa 11, Fla.

## Southern News Briefs

(Continued from Page 21)

### Bay State Abrasive — S.E.

Julius G. Mooney has been appointed Abrasive Specialist to serve the Southeast District for Bay State Abrasive Products Co., Westboro, Mass.



Mr. Mooney's previous employment includes 10 years grinding wheel application experience with Simonds Abrasive Company. He is a graduate of Howard College, Birmingham, Alabama, and a member of the American Foundrymen's Society. He has headquarters in Birmingham, Alabama.

### 1961 Metals Show

More than 275 exhibits, more than 200 technical papers and a Materials Comparison Center will be featured at the 1961 Detroit Metal Show, according to William J. Hilty, exposition manager of the sponsoring American Society for Metals. The event will take place October 23-27 in Cobo Hall.

The ASM Materials Comparison Center, a 12,000 sq ft exhibit area, will present seven engineering materials groups for comparison and evaluation as to specific properties. These include Wrought Ferrous, Wrought Non-ferrous, Cast Ferrous, Cast Non-ferrous, Special Purpose, Non-metallic and Composite. Properties categories are Strength, High Temperature, Corrosion Resistance (Atmospheric), Corrosion Resistance (Processing), Fatigue, Low Temperature and General. Samples will be labeled as to source, and those from exhibiting companies will be identified.

Technical societies and trade associations which will participate in the technical program are: American Society for Metals, Metallurgical Society of AIME, Society for Nonde-



structive Testing, American Welding Society, American Gas Association, Industrial Heating Equipment Association, Metal Powder Industries Federation, Metal Treating Institute, Special Libraries Association and Ultrasonic Manufacturers Association.

#### Zurn Sales Engineer — Ky.

Charles M. Gipperich, Jr., long associated with the industrial sales and engineering profession in the Louisville, Kentucky area, has been



named sales engineer for the Mechanical Power Transmission Div. of Zurn Industries, Inc.

Mr. Gipperich will provide sales and service of Amerigear flexible couplings in the eastern and southeastern Kentucky area and the southern portion of Indiana. His office is located at 2809 Woodward Drive, Louisville 20.

#### BS&B — Virginia

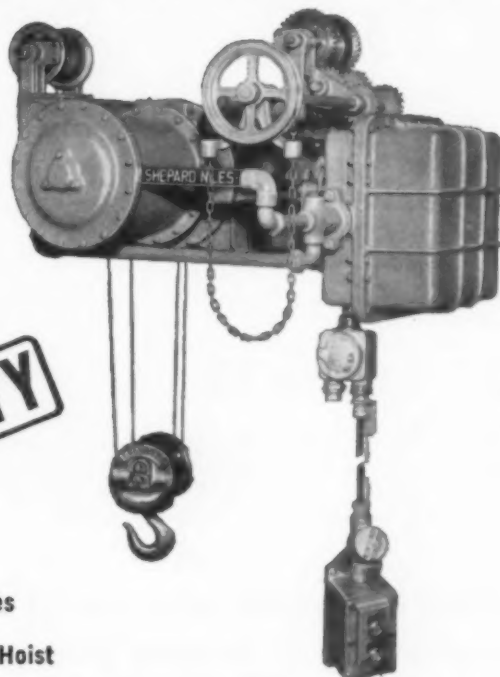
Black, Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo., announces the appointment of the Dave Jewett Company of Richmond, Virginia, as exclusive sales representative in the State of Virginia for BS&B Controls, Safety Heads and Vent Valves.

#### Monsanto Promotions — Atlanta and St. Louis

Bert R. Waterhouse of St. Louis has joined Monsanto Chemical Company's Inorganic Chemicals Division sales staff at Atlanta, Ga.

Mr. Waterhouse replaces Emmett L. Robinson, who has been promoted to supervisor of the division's silica products, with headquarters at St. Louis. Mr. Robinson had been on the Atlanta staff since 1956.

## Shepard Niles Hoists: **JOB-MATED** for Greater SAFETY



**QUALITY**

#### Shepard Niles

#### Explosion-Proof Hoist

In load-lifting and moving operations, the difference between costly accidents and dependable, hazard-free performance lies in quality equipment.

Shepard Niles JOB-MATED Hoists provide superior performance . . . minimum wear and maintenance . . . and extended service life, because we specify the ideal combination of quality components to meet exact on-the-job conditions. Care like this in our plant means greater safety for personnel and equipment in yours.

Shepard Niles offers you a JOB-MATED Hoist for every application. Choose from vapor-proof and explosion-proof models . . . ¼-ton to 30-ton capacities . . . with the new Shepard Niles Safety Hook and Traveling Pushbutton Pendant as added safety features. For further information, write for descriptive bulletin. Ask to have a Shepard Niles representative call.



America's Most Complete Line of Cranes and Hoists

Member of Hoist Manufacturers Association, Inc.

**SHEPARD NILES**  
CRANE AND HOIST CORPORATION

1670 Schuyler Ave., Montour Falls, N.Y.

## Southern News Briefs (Continued)

### Southwest Power Pool Offers Exchange with TVA

Eleven investor-owned electric utility companies of the **Southwest Power Pool** have offered to exchange 1,500,000 kilowatts of seasonal off-peak electric power with the **Tennessee Valley Authority**. J. Robert Welsh, chairman of the executive committee of the pool reports.

In making announcement of the offer, Mr. Welsh said that such an exchange would effect economies for both Southwest Power Pool companies and TVA. The plan would be possible because the pool member companies have their highest usage of electricity during the summer months, while TVA has its highest usage during the winter months. Thus, the pool has surplus power in the winter which it could exchange with TVA, and TVA could furnish power to the pool during the summer period.

The Southwest Power Pool was formed by investor-owned companies to exchange power during World War II. Following the war it con-

tinued to operate for purposes of electric exchange. Four months ago, the power pool companies announced plans for constructing a 4,000 mile network of extra-high voltage transmission lines at a cost of more than \$300 million.

The Tennessee Valley Authority is a government owned electric system which generates electricity for distribution into several Southern states east of the Mississippi River.

The interchange of electricity between the two systems would effect economies, according to Mr. Welsh, because it would make it unnecessary for either participant in the agreement to build electric generating facilities costing many millions of dollars to meet the power needs that would be covered by the exchange agreement. Thus, it would defer large investments in generating facilities thereby providing improved economy to combat the rising cost of producing dependable electric service. The proposal envisions an exchange capability of one and one-half million kilowatts for each of the two power producing groups.

Mr. Welsh pointed out that such an exchange is in keeping with the electric industry's policy of providing for system interconnections to facilitate interchange of electric energy. It would be a further development of the interconnection policy carried out between electric utility systems for many years.

Member companies of the Southwest Power Pool joining in the offer are:

Arkansas Power & Light Co.  
Central Louisiana Electric Co.  
The Empire District Electric Co.  
Gulf States Utilities Co.  
Kansas Gas and Electric Co.  
Louisiana Power & Light Co.  
Mississippi Power & Light Co.  
New Orleans Public Service, Inc.  
Oklahoma Gas and Electric Co.  
Public Service Co. of Oklahoma  
Southwestern Electric Power Co.

### Henry Pratt Co. — Dallas

The **Henry Pratt Company** announces the appointment of George W. Landau as Sales Engineer for the Dallas, Texas Company Office at 192 Meadows Building, Dallas. Mr. Landau has served as a Sales Engineer for the company since 1956.

## COMPRESSED AIR DRYERS Stop Freezing of Air Lines Inside and Outside Entire Plant — Extract Moisture and Foreign Particles — Protect Pneumatic Equipment against Corrosion and operate for LESS THAN 1-CENT PER 18,000 CU. FT.



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### Skullgard Protects Tenn. Millwright

Head protection helped Edward L. Wilson, foundry maintenance millwright at the Memphis, Tenn., Works of **International Harvester Company**, stave off serious injury when struck with a two-pound section of steel cable.

The maintenance man (left) fills in Safety Supervisor Gene Curry with details.

He was floor man in a three-man team using the steel cable to hoist structural steel for an addition to the foundry. After steel was positioned and the sling removed, the sling slipped, fell 35 feet and struck the millwright on his Skullgard. He wasn't hurt, and only damage to the safety helmet was a slight scratch.

Made by **Mine Safety Appliances Company**, Pittsburgh, the head protection is high pressure molded in a single piece of hard, smooth laminated plastic. Special composition reduces helmet weight but retains maximum strength.

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Robvon's Commercial Backing Rings are designed for quick easy alignment of pipe or tubing and assure precise close tolerance fit-up. Robvon Backing Rings allow complete penetration and fusion of the weld. Robvon Backing Rings radiograph perfect certified welds. The patented nubs automatically set the welding gap for the root-pass. The internal bevel and flat inner land assures non-restricted fluid flow.

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**ROBVON BACKING RINGS APPROVED FOR WELDING PIPE, VALVES AND FITTING JOINTS**

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The Chempro line of external "wedge-lock" seals does not require a mounting gland, or any modification to the stuffing box, to align and hold the Chempro seal in position. The patented "wedge-lock" design automatically seats the seal stator in the stuffing box in perfect face-to-face alignment with the seal rotor on the shaft. Simple and easy to install—in only 20-30 minutes.

## OTHER ADVANTAGES

- Completely Interchangeable with Packing
- Simple in Design—Only 8 Parts
- Chempro Teflon® Shaft Packing—Chemically Inert
- External Seals Adjustable After Installation
- Parts Interchangeable Between Seal Styles
- External and Internal Seals Available—From Vacuum to 100 psi

\*du Pont trademark

Write for Bulletins CP551 and 575



7-11 Broadway, New York 4, N. Y.

# NEW Product Briefs

*... there is always a BETTER WAY*

## Epoxy Coating

**K-1** The Hallemite Manufacturing Co., 2446 West 25th St., Cleveland 13, Ohio, has introduced "Sealaway," a new single package epoxy coating in solution form. The product protects concrete, wood, magnesite, cork tile, linoleum and painted floors against traffic wear, deterioration, and disintegration.

Applied as easily as paint, Sealaway penetrates deeply and thoroughly. It fills pores and voids, hardens concrete, toughens wood, and strengthens and reinforces the flooring to form a tough, hard surface.

## Castable Refractory

**K-2** A new high-strength castable refractory has been developed by **The Babcock & Wilcox Company**, Refractories Division, 161 East 42nd St., New York 17, N. Y., for pneumatic gun placement with low rebound loss and minimum dusting. Placed by wet or dry gun methods, the Kaogun-HS castable produces a high strength monolithic body with outstanding abrasion resistance and excellent resistance to thermal shock.

The new gunning castable has a



recommended use temperature of 2500 F. Gunning applications for which it is suitable include linings for ash pits, stacks, incinerator doors, ash hoppers, flues, boiler furnaces, dust collectors and settling chambers, rocket engine static firing bays, catalyst carrying lines in refining and petrochemical plants, by-pass stacks in CO boilers and seal tanks, and as a rear wall seal on traveling-grate furnaces.

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## Static Starter

**K-3** A new static starter for motors, utilizing the Westinghouse-developed silicon-controlled rectifier as the main power switch, has been developed by **Westinghouse Electric Corporation**, General Purpose Control Department, Buffalo, N. Y., to replace electromechanical or ignition contactors in scores of electrical, general industrial, and military applications.

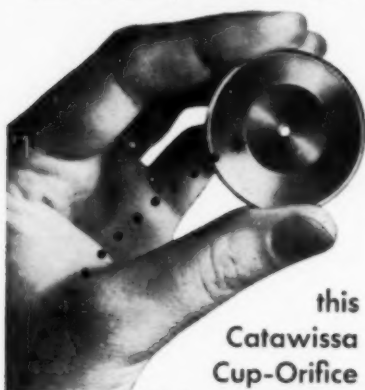
The "Trinistor" device, like the silicon cell of which it is a derivative, blocks conduction in the reverse direction. However, it provides complete control of conduction in the forward direction. By proper arrangement of the units, it is possible to have total control of a 3-phase inductive or resistive load. The low energy level signal required to control a Trinistor device makes it possible to monitor a load directly from a computer without preamplification.

The static starter offers great potential for remote operations. Examples are automated power plants or remote pipe line control. The static control device also has been found applicable for heat control in electric furnaces and wire-enameling operations. Standardized starter de-



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signs are applicable to 20-horsepower  
motors "across the line," and up to  
75-horsepower motors with reduced  
voltage.

### Instant Floor Patch

**K-4** Ranco Industrial Products  
Corp., 13311 Union Ave.,  
Cleveland 20, Ohio, an-  
nounces Magic Floor, a new material  
for repairing industrial floors. It is  
said to be ideal for patching holes



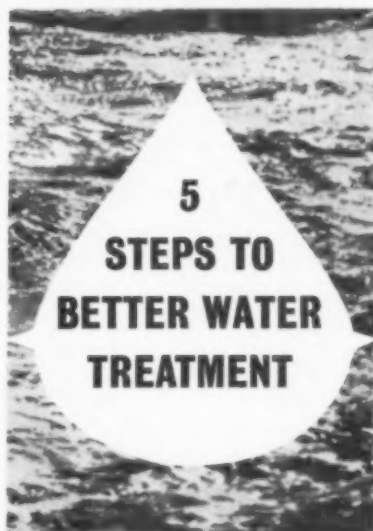
and irregularities in any trucking  
surface, for indoor and outdoor serv-  
ice.

Magic Floor will permanently re-  
pair floors of concrete, wood, wood  
block, steel, brick or asphalt and is  
exceptionally adaptable for filling in  
over conduits which are placed in  
wood block floors. It requires no  
mixing, no trowelling, no drying  
time. It is ready to use as it comes  
in the container. Any handyman can  
apply it, and traffic rolls immedi-  
ately after application. Improved manu-  
facturing technique retards immedi-  
ate tackiness which allows patch to  
be set by rolling without first dust-  
ing with dry cement or sand.

### Jacketed Angles

**K-5** Johns-Manville, 22 East  
40th St., New York 16,  
N. Y., has introduced a  
new technique in applying jacketed  
pipe insulation, which allows job-  
site fabrication of aluminum-covered  
elbows, turns, sweeps, and bends di-  
rectly from straight lengths. De-  
veloped for use with the company's

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CHEMICAL COMPANY

DIVISION OF PFAUDLER PERMUTIT INC.

## New Product Briefs (Continued)

Metal-On system, the time and money-saving method is made possible by a pre-formed band, called the "Miter-Seal."

According to J-M, use of Miter-Seals for angle insulation eliminates the many complex operations previously necessary for insulating fittings and bends, as well as stocking and storage problems with pre-formed humped elbows and fitting covers. Miter-Seals, available for use with pipe sizes from  $\frac{3}{4}$ -in. up to 24-in., now allow application of jacketed insulation in many cases where it was not possible except on straight runs.

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#### Heat Exchangers

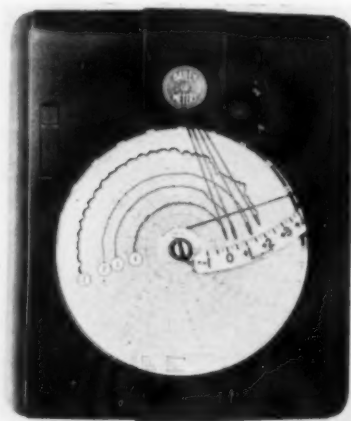
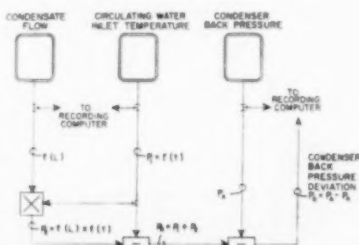
**K-6** Basco, Inc., 345 Payne Ave., North Tonawanda, N. Y., has made extensive strides in the utilization of "O" Ring Seals in shell-and-tube heat exchangers. This has resulted in development of an externally packed floating head of improved design which is a standard feature on all Basco Type OP exchangers.

The double "O" Ring Seal permits the tube bundle to expand and contract without harmful strain or intermixing of shell and tubeside fluids. The "O" Rings retain compression without adjustment and are unaffected by vibration or temperature changes.

#### Performance Computer

**K-7**

A condenser performance computer that produces continuous records of condensate flow, condenser back pressure, cooling water inlet temperature and condenser back pressure



deviation for proper evaluation of condenser operation has been developed by **Bailey Meter Company**, 1050 Ivanhoe Road, Cleveland 10, Ohio.

The computer predicts the optimum pressure for the operating load (taking water temperature into consideration) and compares it with the

actual back pressure measurement. The resultant "deviation" indication, which is independent of environmental conditions, instantaneously reveals a condenser fault.

The unit consists of four plug-in recorder servos which fit into a four-pen recorder case. The computer plots the operating point on predicted performance curves using Heat Exchange Institute data and formulae on heat transfer rates between wet steam on one side of a tube and water on the other side.

#### Non-Metallic Epoxy Cement

**K-8** Smooth-On Manufacturing Company, 572 Communipaw Ave., Jersey City 4, N. J., has developed a silica-filled epoxy cement. The new cement is the non-metallic "running-mate" of Smooth-On's standard Metalset A4.

Known as Sonite EG-2, the new compound offers exceptional flexural strength, together with abrasion resistance. It sets rapidly at room temperature following a one-to-one mix of its two parts. Electrical properties are excellent and shrinkage negligible. Adhesive strength in flex is the highest obtained to date in the manufacturer's long experience as a specialist in industrial epoxies.

#### Two-Way Radio

**K-9** General Electric Company, Communication Products Dept., Lynchburg, Va., has announced a portable two-way radio for business and industrial use, described as the smallest, lightest, most compact VHF-FM man-carried communications unit to be marketed to date with the transmitter and receiver in a single case.

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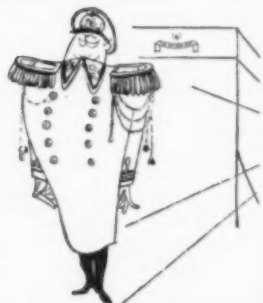
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1760 Peachtree Road, N. W.  
Atlanta 9, Georgia



The new personal communication units are manufactured for high band frequencies (132-174 mc) with one watt transmitter RF power output. This is the highest power output in the industry for a small-case unit.

Called the "Voice Commander," it is 9.5 inches high, 5.3 inches wide



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and 1.7 inches deep. It weighs slightly more than 3 pounds.

### No Overspray Damage

K-10

An extremely durable and unusual protective coating has recently been developed by the Wilbur & Williams Co., 650 Pleasant St., Norwood, Mass.

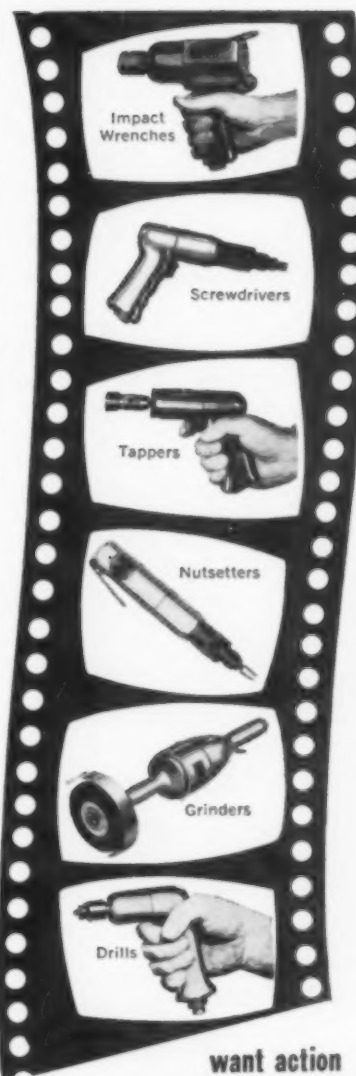
The new "Landmark" metal coating, which must be spray-applied because of its fast drying rate, precludes property damage claims from areas adjacent to high-rigging paint jobs by drying completely to form a non-adhesive powder in a 20 ft free fall, at 60 F.

### Back Pressure Regulators

K-11

A new line of back pressure regulators is now available from OPW-Jordan, 6013 Wiehe Road, Cincinnati 37, Ohio. The #165 series is stocked for immediate delivery in 1/4"-2" sizes. The valves are suitable for 250 psi at 500 F in ductile iron and bronze bodies, and 300 psi at 600 F in stainless steel and cast steel bodies; and suitable for steam, water, air, oil, gas or chemical service.

Designed to maintain a constant back pressure or to relieve pressure at a given set point, the self-contained valve gives tight shut-off and accurate control during operation. The self-lapping, self-cleaning sliding gate seats also help minimize maintenance. Five control ranges are available from 3 to 170 psi.



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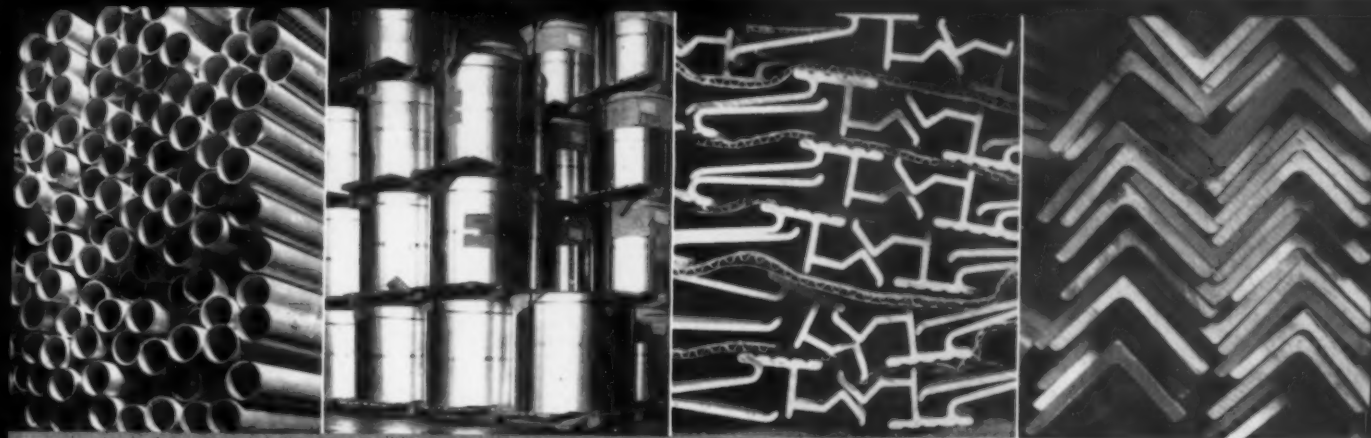
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